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War Declared On Lingo

By Marcy Rosenberg
CW Staff

CINCINNATI — Contrary to the old "sticks and stones" refrain, words can hurt — the pocket, at least — at the University of Cincinnati, which will fine administrators 25 cents if they misuse certain words derived from computer community vernacular.

The university has declared the words "input" and "feedback" taboo and will probably outlaw several dozen others by the end of the year, according to John McCall, the school's provost and also an English professor.

McCall, who is leading the campaign against "colorless language" from any source, emphasized that "while the project is serious, it's in the guise of something intended to be fun."

It all started with a memo McCall sent to deans at the beginning of the year asking that they appoint a staff member to collect 25-cent fines from university officials who use either "input" or "feedback" out of context, whether in conversation or in writing. When used as technical terms by computer scientists, the words "input" and "feedback" are accurate and meaningful, McCall said, "but I don't like them used in the metaphoric sense.

"One of the things that really curdled me and made my spine turn to buttermilk was when a colleague used the phrase, 'Suppose I take this piece of input' at a meeting. What he meant, I guess, was, 'Suppose I take this idea.' But 'a piece of input' sounds like something dirty."

(Continued on Page 4)

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Happy Anniversary?

By Connie Winkler
And E. Drake Lundell Jr.
CW Staff

NEW YORK — Ten years ago last Wednesday, on the last day of the Johnson Administration, Justice Department lawyers dashed into the federal district court here and filed an antitrust suit against IBM.

The Vietnam War was then at its height, the Nixon Administration was just about to go to work, Watergate was only a fashionable apartment complex, the IBM 370 was a gleam in Gene Amdahl's eye and Jimmy Carter was selling peanuts.

A lot has changed in the computer community and on the national political scene during the decade, but the IBM case is still with us, raising some interesting questions about the industry and about antitrust law and its application.

One thing is clear, however. The case certainly has not slowed down IBM.

In 1967, the last full year before the case was filed, the firm earned $651,499,558 on sales of $5,345,290,993 — but in the 10 years of the court case it has been able to almost quadruple its sales and quintuple its earnings. In 1978, the firm earned $3,110,000,000 on revenues of $21,100,000,000 (rounded off to the nearest $10 million).

Today, IBM's cash and marketable securities in the bank almost equal all of its revenues for 1967. That's probably

(Continued on Page 8)

We're Sorry For Tardiness

The snowstorms that have battered the Midwest and Chicago in particular have also taken their toll on *Computerworld*'s distribution pattern.

CW has been printed in Chicago for more than a decade now in order to supply the best possible delivery service to our far-flung readers. Almost 60% of the papers are airshipped from Chicago's O'Hare Airport — the busiest in the world — to expedite delivery nationwide.

During the past few weeks, the storms and bitterly cold weather have halted air operations at O'Hare several times, causing delivery delays of *Computerworld*.

We apologize for any inconveniences this has caused our readers and assure you we are looking forward to spring as much as anyone.

Major Obstacles Block Viewdata Use in U.S.

By Ronald A. Frank
CW Staff

NEW YORK — While the UK's highly touted Viewdata service holds much promise for U.S. users, major roadblocks still stand in the way of its widespread use here, according to John Bately, senior vice-president of the Insac Group, which will market the service in the U.S.

Viewdata, known as Prestel in Great Britain, is a computer-communications system that gives home or business users an interactive means of accessing a large number of data bases over standard two-wire voice-grade phone lines using Touch-Tone telephones and conventional TV sets.

The system has even been expanded into a full-blown program distribution system and distributed data processing facility for use in program development in the UK [CW, Nov. 13].

However, the British-developed system will have to overcome several hurdles before it is useful here, Bately indicated at a demonstration of the system held here last week for financial analysts by Drexel Burnham Lambert, Inc., a Wall Street brokerage firm.

First, the system was designed to be

(Continued on Page 6)

From RCS Vendor

Another 370-Type Mini Set

By Don Leavitt
CW Staff

GREAT NECK, N.Y. — The trend continues. Another remote computing service (RCS) vendor has announced plans to sell or lease an IBM 370-compatible minicomputer, complete with software and support, for a cost "well below alternatives."

To handle this side of its business, Time Sharing Resources, Inc. (TSR) has organized a subsidiary called Mega Systems Associates. The hardware Mega will offer is the same 370/138-class machine developed by Two Pi Co. and already available from National CSS, Inc. as its System 3200.

Installed at a user site, Mega's system is "the first sensible alternative to the high costs of outside APL timesharing," a vendor spokesman asserted, adding "it provides at least 5:1 price/performance breakthrough, with no conversion delays or costs."

The difference between the Mega system and those offered by other RCS vendors will be in the software and services provided users, Mega said. TSR is an APL-oriented RCS vendor and the Mega system will be delivered complete with all the system software and application programs in the TSR public library.

The spokesman claimed TSR's APL system is the most comprehensive in the industry, adding, "it is fully compatible" with major APL time-sharing vendors such as Scientific Time Sharing Corp. (STSC). An official at STSC noted, however, that TSR's APL does not include STSC's Automatic Control of Execution (ACE) functions [CW, Aug. 28].

As part of its product, Mega said it is

(Continued on Page 6)

AT&T Calls 'Preposterous' Arguments to Split Up Bell

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Justice Department's attempt to break up the Bell System is based on a distorted and historically ignorant view of telecommunications development in the U.S., AT&T charged in federal district court here.

In a "Statement of Contentions and Proof" filed Jan. 8, the company asked the court to reject the government's attempt to split up the Bell System. It called the government's arguments "preposterous" and its requested remedies potentially "catastrophic" to the public interest.

Basically, AT&T claimed, the government's case, while based on a series of "alleged acts" characterized as a "continuing course of monopolistic conduct," is actually directed at the "structure of the Bell System."

The thrust of the company's counterargument is that the Bell System has developed in conformity with government regulation. Thus, it cannot be perceived as the manifestation of an organization bent on monopolizing the U.S. telecommunications industry, AT&T indicated.

The AT&T document was filed in response to a Nov. 1 Justice Department statement which described how the U.S. would seek to fragment AT&T should it win the antitrust suit, now in its fourth year. The department said it would ask for the divestiture of AT&T's manufacturing arm, Western Electric Co., and its research and development operation, Bell Laboratories, as well as some — or all — Bell operating phone companies and the

(Continued on Page 8)

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Insurance Board Probing DP Fraud

By Marcy Rosenberg
CW Staff

AUSTIN, Texas — The Texas State Board of Insurance has launched a major investigation into the activities of a Houston businessman accused of pulling off a multimillion-dollar "computer fraud" against numerous insurance companies, lending institutions and borrowers.

The target of the investigation is a group of allegedly fraudulent insurance operations controlled by Aubrey Jerald ("Jerry") Gordon, a convicted embezzler.

Gordon-controlled companies are accused of doing insurance business without a license and also of defrauding licensed insurance firms and lending organizations via computer manipulations when acting as agents for these companies.

Gordon or company staffers apparently rigged a home office computer to print out fraudulent information on policies issued and premiums collected, according to Tom McFarling, deputy insurance commissioner. Gordon periodically sent such information to the firms he dealt with in the form of computer reports which McFarling claimed "contained a substantial degree of romance."

For example, Gordon sold group credit life insurance policies for more than the state legal limit of $20,000. If a policyholder paid for, say, $50,000 worth of coverage, Gordon's computer would reject that figure and substitute $20,000 on the report, McFarling said.

In this way, Gordon made money by reporting lower premiums than he actually collected. In that example, if the policy premium were $10 per $1,000, he would collect $500 but report only $200 to the insurance company for which he was acting, McFarling explained.

A complaint by one insurance company sparked preliminary probes into Gordon's business activities by Insurance Commissioner E.J. Voorhis and Attorney General John Hill.

Subsequent charges that a number of Gordon's operations were insolvent and acting as unlicensed insurers led Austin District Court Judge Pete Lowry to place them in temporary state receivership.

The operations include The Phoenix Companies, Inc., a Utah holding company in which Gordon claims to have an 80% interest; its Phoenix Companies assumed-name operations in Houston; and Eagle Financial Services, an entity controlled by the holding company.

Prior to the receivership order, these firms were in business about a year and a half, according to John Wooddell, attorney for court-appointed receiver Anthony G. Harris of the State Board of Insurance, Liquidation Division. Harris is a key figure in the current investigations.

Harris and a staff of accountants are using a computer to process and analyze the insurance certificates found in Phoenix Companies offices to get more information on the Gordon operations.

"Our office is full of letters — maybe 10 to 50 per day — from people requesting, demanding, pleading and threatening because their insurance policies [obtained through Gordon] turned out to be worthless or worth less than they had thought," Wooddell said.

Estimated Haul

Asked how much money Gordon made from his operations, Wooddell estimated, "We'll end up with 250,000 certificates. The 45,000 we've processed so far represent about $220 million in coverage.

"When we're through, that total could reach $1 billion and the premiums on that amount add up to big bucks," he said.

Questionable practices cited by Wooddell were not reporting policies issued for outside insurance companies; writing and backdating policies on people who had died; layering policies; lowering ages on credit policy certificates to make the insured look like better risks; and changing accident or health policies to lower-premium credit life insurance and keeping the difference in premium amounts.

'Massive System Problems'

The apparent intricacies of Gordon's business have caused "massive problems with our own computer," according to Wooddell. "When we pick up a certificate, we don't know if it's an original, layered policy or a rewrite — with altered ages, amounts of coverage or policy types. We've found cases of all three, issued as separate policies to the same individual."

To detect such duplicates, investigators are preparing several computer runs, each keyed to different policy certificate data, such as debtor's name or lending institution, amount of coverage and name of insurance company, Wooddell explained.

Concurrently, the Federal Bureau of Investigation, the Postal Inspector and the Securities and Exchange Commission have started probes of their own into Gordon's operations. In addition, a federal grand jury in Houston has subpoenaed the receiver's records on Gordon.

Gordon, who has denied any wrongdoing, has a history of criminal activity. In 1961-1962 his firm, Universal Insurance Co., was permanently joined from doing business because it was operating as an unlicensed insurer. Gordon also spent four months in federal prison in 1967 for embezzling money from Sacul State Bank in Tyler, Texas, where he held an executive post, Wooddell said.

No formal criminal charges have been filed, according to, Gordon's attorney, Tom Alexander, who added, "I don't anticipate he will be charged with anything.

"The only mistake he's committed so far, that there is any proof of, is that his business has not succeeded," Alexander said.

On the Inside This Week

NEWS
POS Terminals for Retailers Highlight Exhibit 4
GAO Moves to Halt Labor's Automation Project 5
Supplier Charged With Larceny via Micro 7
U.S. vs. IBM Case Marks Its 10th Anniversary 8
National Information Policy Shaping 9
Service Quantifies Nonproductive Activities 10
NTIA Drawing Up Private-Sector Privacy Act 11
Group Training DP Students in Harlem Garage 12
Immigration Service to Decentralize Visa Work 13
'Art Cop' Starts System to Trace Stolen Works 14
Conference to Feature 'Peter Principle' Author 15
Programmer Retiring After 41 Eventful Years 17
Fed Seeks Comments on Proposed EFT Rules 19

EDITORIAL
Editorial: Obnoxious — And Dangerous. 20
Human Connection: How 'Troops' See Manager . . . 21
Taylor Report: No Yielding on Contract 21
California Bank Blames Jam on Computer 21

SOFTWARE & SERVICES
DBMS Altered to Support Shared Data 25
'UCC Seven' Enhanced 26
Organization Change Seen Major DBMS Factor . . . 28
'Tips' Manages Word Processing 30
Real-Time Warnings Would Ease System Use. 31

COMMUNICATIONS
Fiber Optics a Reality for Data Users 33
Swift International Bank Network to Expand 34
ECR Helps Consolidate Inventory and POS Data. . . 35
Printer Compatible With Mini Disciplines. 36

SYSTEMS & PERIPHERALS
CBS Goes On-Line to Manage 'Nothing'. 39
Savings 'Significant' With Independent Drives. 41

MINIWORLD
Business System Boasts Diagnostic Capabilities. . . 45
Mini Maker Follows Own Advice: 'Automate' 46
Double-Density Disk Suits LSI-11. 48
Mini Helps Hosiery Maker Ride Fashion Tide. 50

IN DEPTH
New Software Economics: Part 3 . . . . Follows Page 52

MICROCOMPUTING
Micro Lets Anesthesiologists Rest Easy 53
System Built Around 6800. 54

COMPUTER INDUSTRY
DP Firms Need Balanced Management 55
Consolidated Computer Makes Big Profits 55
CIA Details DP's Part in U.S. Trade Deficit 58
Group to Support Micro Industry 59

SUPERSORT

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(Beware of imitators in long red underwear.)

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Until fairly recently, these Boys from Armonk had the DOS sorting turf pretty well to themselves. We won't say they had a monopoly. But, well, we did notice that they laughed a lot on the way to the bank!

Then — shazzam — everything changed. A couple of leading-edge DOS/VS users left their windows open one day. The next thing you know in flew this big new sort. It announced that it was SyncSort DOS and that it "aimed to clean up DOS sorting" the way it had OS.

Sure, there were chuckles at first. But when the big fellow in the red suit sat down to the computer to sort the laughter stopped. Because it soon became apparent that DOS/VS really did have a "Supersort" for the first time.

Since then SyncSort DOS has flown into the windows of about 400 DOS centers. The reason is simply *superperformance*. In comparison with any one of the IBM DOS mob, SyncSort DOS will yield resource savings of:

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The next time a suspicious sort wearing baggy long johns and a counterfeit S pinned to its chest shows up, call us. We'll send over a SyncSort DOS faster than a speeding bullet — provided traffic isn't too bad.

As soon as it arrives, say something like: "Okay, boys, you both claim to be supersorts. Let's see which one of you can leap over this towering load in a single bound."

Only please leave the window open. Because when that other sort gets a look at the benchmark results, it's liable to take a flying leap into outer space.

And we sure get tired of cleaning up that broken glass!

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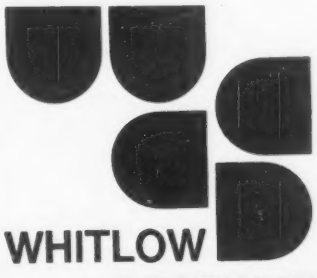

WHITLOW COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

POS Terminals for Retailers Highlight Exhibit

By Ronald A. Frank
CW Staff

NEW YORK — Point-of-sale (POS) terminals for a variety of retail environments were shown at the annual conference of the National Retail Merchants Association here last week.

NCR Corp. introduced the Model 2152 for department and specialty stores. The terminal has three printers for journal, receipt and sales slips and contains 48K bytes of storage for sales tax and other price data.

The Model 2152 includes a 16-character alphanumeric display and offers OCR-A scanning with a wand reader. Credit and check authorization capabilities are among its options.

A dual-printer model costs $3,945 while a three-printer unit is priced at $4,345 for delivery in April.

NCR also expanded its transaction mode processors with three configurations of the T-8270 small business system. The models include a central communications processor, a cluster support processor and an in-store CPU.

Peripherals include disk storage, magnetic tape, CRTs and communications interfaces for NCR terminals. Prices range from $25,000 to $100,000 with first deliveries set for mid-1979.

The firm also introduced the Model 7750 remittance processing system, which includes a minicomputer, printer, CRT and up to eight document-processing stations with OCR and magnetic ink character recognition (MCR) reading capabilities.

A basic 7750 system with a single document-processing station costs about $55,000 or $1,500/mo on a five-year lease. Additional processing stations cost $55,000 or $900/mo, also on a five-year lease. The system is available now, NCR said.

Sweda International of Pine Brook, N.J., added to its System 80 POS equipment a CRT terminal that operates with an in-store controller as an entry device in cash offices and receiving rooms. Designed to add purchase order management and payroll input, the CRT can be clustered in four-terminal configurations using an interface board, a spokesman said.

The 2,000-character CRT is hardwired to the controller and operates at 9,600 bit/sec. The terminal will be officially introduced in the spring, with first deliveries later this year.

Sweda also added a cassette storage capability to the L35 electronic cash register. The store-and-forward unit, which can be polled, operates with most standard 1,200 bit/sec asynchronous protocols.

The tape cartridge cassette unit is made by ICL Computers, Inc. and costs $2,650 with support for up to four L35 registers. First deliveries are set for April.

Double Features

Data Terminal Systems, Inc. of Maynard, Mass., introduced the Model 515 system, which has electronic cash register and POS features. Memory expansion allows the addition of stock-keeping unit (SKU) data and charge posting to the system.

The Ans-R-Tran option allows the Model 515 to transmit data to IBM, Digital Equipment Corp., Wang Laboratories, Inc. and Data General Corp. CPUs through emulation capabilities. The IBM emulator uses 3780 protocol while the DEC feature allows the 515 to emulate a PDP-11.

The emulators cost $595 each. The Model 515 costs $3,000 to $6,000 and has the ability to handle an inventory of 12,000 to 15,000 items.

Data Terminal Systems also showed a terminal that can consolidate in-store data and transmit the information to a remote CPU without an on-site controller or in-store processor. The Model 550 terminal ranges in price from $3,000 to $6,000.

TRW, Inc. of Hawthorne, Calif., introduced the microprocessor-based Modular Store Processor (MSP) to handle entry-level systems. Used with earlier TRW POS terminals, the MSP can be expanded beyond checkout functions as a retailer's POS needs increase, the company said.

The basic MSP controls up to 16 terminals and can be expanded to handle 32 units. It can transmit data to standard CPUs currently used by retailers and service bureaus and is compatible with credit authorization systems, TRW said.

A basic MSP system with 14 terminals capable of multiple-day storage of data costs about $71,000.

Specialty Store Unit

Datatrol, Inc., Hudson, Mass., showed its RS-6052 POS terminal, designed for specialty chain stores. Developed for use with an in-store processor or service bureau, the terminal is said to have over 40 programmable totals that can be accumulated for control over inventory and other parameters.

The terminal has a 16-character display and four transaction modes.

The basic RS-6052 costs $2,995 and includes cash drawer, calculator, split tender, logo printer and SKU check-digit verification.

ICL Computers, Inc., East Brunswick, N.J. demonstrated various configurations of its 950 retail business system, which includes programmable POS terminals and in-store processors. The 9500 is based on Singer's POS operations, which ICL acquired. Deliveries of the system will begin in March, a spokesman said.

CW At NRMA

Two Canadians Get Suspended Sentences

By Brad Schultz
CW Staff

EDMONTON, Alta. — Two former college students found guilty of stealing telecommunications services for playing on a campus mainframe without permission have been given one-year suspended sentences. The maximum penalty could have been 10 year's imprisonment.

Alberta Supreme Court Justice John Hope told 19-year-old Bruce Christensen and 20-year-old Michael McLaughlin that all records of their felony convictions will be erased if their behavior seems satisfactory during a year of probation.

Hope set a precedent in Canadian law last month by convicting Christensen and McLaughlin under Section 287 of the Canadian federal criminal code [CW, Jan. 8]. The section, which prohibits "theft of telecommunications services," does not mention computing, but Crown prosecutors felt it is the only federal statute applicable to security breaches of computer facilities.

After the sentences were announced, F.M. Feehan, Christensen's attorney, said he would not challenge the relevance of Section 287 or the "mischief" statute in an appeal. Feehan said that a motion to appeal on such grounds — whether filed by himself or by McLaughlin's attorney, Daniel Hagg — could provoke a cross-appeal by the prosecution, and a higher court could then impose much stiffer penalties on the defendants.

Hagg is considering whether to file an appeal, which would send the matter from the Trial Division to the Appellate Division of Alberta's Supreme Court. The next and final appeal available to the defense would be to the Supreme Court of Canada in Ottawa.

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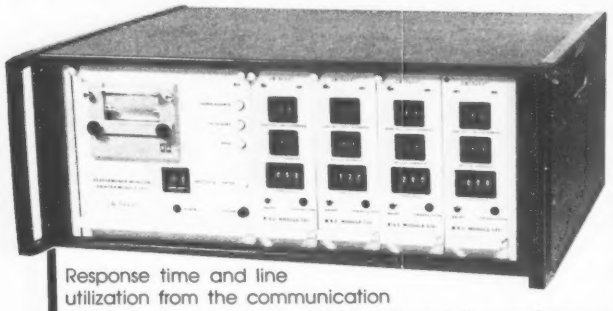

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War Declared on DP Lingo

(Continued from Page 1)

Most of these kinds of usages "come from educated, well-trained people who are inclined to talk in abstract, colorless language," he added. "My army sergeant used better language — at least it was more colorful."

DP patois began to crop up more frequently in everyday speech as computers became more a part of society, McCall said. "There are more people around who use the equipment and recognize its advantages."

However, when it comes to misusing computer industry terms, McCall isn't sure DPers are the major culprits. "Those more remote from computer technology have heard the lingo and pick it up to sound more intellectual," he explained.

The DP community "may be more conscious of the fact that outsiders need a different kind of language. I think it would be useful if people in the industry would question the use of their jargon by persons outside the field," he proposed.

"The precision that normal English words can give you is lost in jargon," McCall maintained. For example, when asking for "feedback," a speaker could want a response, a reply to a query or an emotional reaction.

"Interface" is another word McCall may add to his blacklist. "People no longer say, 'let's your and my office keep in touch,' but rather, 'let's interface our operations,' " he lamented.

On the whole, McCall's war on words was well-received. University vice-presidents have started to participate and "fan mail" is pouring in.

McCall cited one letter from Business Vice-President Mike Ullman, to whom the university's computer center reports. It went like this:

"I feel compelled to forward some feedback on your recent output on the word 'input.' We in the information systems field have a special place in our hearts for the word 'input.' It refers to the process of entering data into a computer system. I have instructed the computer center to try such techniques as 'ideas' into the system . . . or even 'contribution' into the system as a term for data entry . . ."

The money collected from the project will be used to boost the university's book endowment fund. So far, revenues stand at $4.

Calls It '$250 Million Boondoggle'

GAO Moves to Halt Automation at Labor

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — A U.S. Labor Department plan to reduce costs in state-level employment programs through automation has turned into a $250 million boondoggle, according to the General Accounting Office (GAO).

What started as a good idea — to make the programs more efficient through the sharing of facilities, equipment and data bases — has evolved into a project running three years behind schedule and costing 50% more than originally estimated.

In a recent report, the GAO called for a halt to the Employment Security Automation Project (Esap), which has already cost $71 million and into which the Labor Department is prepared to sink at least $180 million more.

Esap is a classic example of the problem that can arise from indiscriminate automation, according to the GAO. Its report blamed Labor for not properly planning, testing or evaluating the proposed automated systems and cited "a lack of management control over the project at Labor headquarters" as a main reason for Esap's problems.

Success, Mystery

Even more amazing, the GAO found, was that despite the known cost overruns and delays in the project, the Labor Department has never made a concerted effort to determine the success of the program. The department told the GAO that the project is merely a funding mechanism and that its success must be determined on a state-by-state basis.

The GAO, however, said the methods of automation advocated by Labor "have not been sufficiently tested to warrant statewide implementation in all states." In fact, the GAO has "been unable to determine exactly what Esap was intended to accomplish."

In May 1976, Labor's Employment and Training Administration announced the project, which was "to coordinate the development, implementation and operation of automated employment security systems nationwide," the GAO said. Labor believed automation would produce "greater efficiency and ecomony" in state employment programs.

The project, Labor estimated, would take five years to complete at a cost of $170 million.

Since its inception more than two years ago, however, the project has experienced many problems," the GAO said. "The estimated cost has risen to more than $250 million and may go even higher. The completion date for the project has slipped from 1981 to 1984 and will probably slip further.

"States have had difficulty in implementing their plans because of insufficient computer capacity and delays in acquiring new computers," the GAO report said.

While the project has experienced delays, cost overruns and other problems throughout its two-year history, the GAO found the basis for part of Esap's failures goes back at least a decade. Although experiments with computerized job matching have been going on for 10 years. "Labor has not demonstrated that this system is an effective way to find jobs for people and people for jobs."

When the GAO gathered and analyzed data from several states on the effect of computerized job matching, the data showed that "comparatively few placements are being made through computerized matching" and no evidence was found "on whether the quality — for example, duration, wage or skill level – of placements has improved because of computerized job matching."

Another glaring failure to properly manage the program, GAO contended, is that Labor is placing little emphasis on those forms of automation "where many see a real payoff" — automating some routine functions to eliminate paperwork and streamline local employment office operations.

The study located similar problems in Labor's goal of unemployment insurance automation, in which states would "install computer systems that include computer terminals in all local offices for data entry and inquiry into central computer files."

The idea behind that goal was that the cost of installing and maintaining those systems would "be recovered through reduced funding by Labor to the states in future years." The reduced funding would be possible because of the savings realized through an automated insurance program.

But here, too, "Labor has not adequately evaluated the costs and benefits of these systems," the GAO found.

The study concluded that "although the concept of cost recovery has appeal, the methodology involved and limited experience to date raise serious questions about the states' abilities to reduce personnel costs sufficiently to cover the cost of automation, while maintaining satisfactory levels of program quality control and service to claimants."

The GAO report recommended that Esap be halted and that Congress appropriate no further funds for it until the Secretary of Labor can complete a "comprehensive" study of the project.

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Use of Viewdata Service Blocked by Two Obstacles

(Continued from Page 1)

used with European television sets, which differ from U.S. units. Secondly, the way the system is marketed in the UK requires users to purchase a specifically designed television rather than just a "black box" to connect to their present TV sets.

As implemented in the UK, the specially designed TV receivers feature 1K byte of core storage that is used to refresh the screen image called up via numeric commands entered on the Touch-Tone phone. While it would be possible to provide a "black box" to adapt a conventional TV set to receive Viewdata information, a decision was made in the UK to manufacture only complete receivers in order to generate more revenue, Bately said.

As presently designed, the system is compatible with 625-line TV rasters such as those used in the UK and will not work with 525-line rasters used in U.S. TV images. The 960-character screen display is called a page, and pages are called up via telephone depending on the commands entered by the viewer.

3 Seconds Per Page

The system transmits data at 1,200 bit/sec and the average transmission time for a page is about three seconds, Bately said.

Pages remain on the TV receiver as long as the viewer wants to retain the data because the refresh capability is in the receiver. Bately contrasted this method with other systems, such as the French Antiope, which interleave displayed data between normal TV frame transmissions and have no on-site refresh capability.

If Viewdata were operated with intelligent terminals, complete programs could be downline-loaded into the receiving units. However, this would significantly increase the cost of the service, Bately pointed out.

As presently structured in the UK, Viewdata costs about 10% to 20% of conventional computing services, Bately said. Access fees range between 30 cents and 60 cents per page; about 170,000 pages of information are now in the Viewdata data base, which is being accessed by about 500 subscribers participating in the British market trial.

Later this year, the British Post Office plans to introduce the service as a full public offering, Bately revealed.

A videotape demonstration of typical Viewdata services was shown which included samples of a wide range of applications that can be accessed by viewers in the UK. Included were an airline reservation system that allows the subscriber to access the airline schedule, select a flight and make a confirmed reservation in conjunction with a travel agency.

Shopping services which included the ability to browse through a listing of TV sets available at a department store were also shown at the demonstration. After selecting a 20-inch screen requirement, the viewer called up a specifications and price list of receivers in that size available in the store. A set could be selected and purchased and credit payments could be arranged through commands entered by the viewer.

Also shown were samples of stock market and investment listings, information published in the *New York Times* on a particular day, career help which included a listing of available job openings by employer and a series of educational problems.

Bately said about 50% of the subscriber cost of Viewdata is for hardware, with the remainder divided between the software and the communications costs.

British subscribers are billed for Viewdata service on their regular telephone bill, and charges depend on the number of pages accessed during the billing period.

CW Photo by R. Frank

John Bately points out the features of Viewdata's TV receiver at a demonstration on Wall Street last week.

If Insac introduces Viewdata service in the U.S., it will probably do so in conjunction with a large U.S. corporation. The service might initially be structured to serve closed user groups in specific industries, Bately said.

Another RCS Vendor Plans To Introduce Minicomputer

(Continued from Page 1)

prepared to convert any user program to run in APL on the Two Pi hardware at no cost to the user. Although that support is generally expected to be used in connection with programs already in APL, the vendor claimed the support — still free — will be provided no matter what the source language of the original program.

Along with the APL compiler and its support system, the TSR software includes a keyed file system and program products for financial, econometric and data base management applications, the spokesman said. The directory published by the Association of Time-Sharing Users lists items such as a portfolio analysis and evaluation program, support for Box-Jenkins time series analysis, and a text and letter writing system.

The various data bases that can be accessed through TSR's communications facilities presumably will not be part of the package offering, since they would effectively be impossible to maintain and update as they must to be remain useful.

Sixth to Enter Arena

TSR's entry — through Mega — brings to a full half dozen the number of RCS vendors now in or almost in the hardware arena. In addition to National CSS, others include Keydata Corp., General Electric's Information Services Division, Automatic Data Processing, Inc. (ADP) and STSC.

Most of the equipment being offered by those vendors is in the IBM 370 138 and 148 classes, although GE moved in a different direction with hardware comparable to IBM's 8100 minicomputer.

Mega expects to deliver its first system in june. When STSC announced its APL-oriented Quad 100 minicomputer, [CW, Dec. 4], it said deliveries would start in the first quarter of 1979, but a spokesman last week admitted his firm has yet to select a hardware supplier.

Mega is offering its hardware/software/support package under a six-month lease plan for $15,000/mo. It can also be purchased for $100,000 or leased, under a facilities management-type plan in which Mega would operate the system (at a Mega site), for $20,000/mo.

Under any of these plans, the system should be an attractive offering to the "heavy" time-sharing user who currently spends $100,000 or more each month for RCS support from an outside vendor, Mega said from 777 Northern Blvd., Great Neck, N.Y. 11022.

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'How About Kicking Off With a Good, Old-Fashioned Memory Dump?'

Pleads Innocent in Billing Scheme

Supplier Charged With Larceny via Micro

By Marguerite Zientara
CW Staff

CORAM, N.Y. — A supplier of pesticides and snow-melting chemicals has pleaded innocent here to 20 counts of larceny and attempted larceny in an alleged false billing scheme involving every state in the union and possibly up to $2 million worth of phony bills. The accused perpetrator allegedly kept track of the phony bills on a microcomputer in his home.

Larry A. Glassner, 33, married and the father of four, was arrested on Dec. 23 after a three-month investigation initiated by a suspicious city attorney in Richland Hills, Texas, who had received a bill for supplies he had never ordered or received.

Glassner, a former chemical salesman, apparently ran two "semilegitimate" supply companies out of his home, according to a spokesman for Suffolk County District Attorney Patrick Henry. "In some cases he may have delivered and in some cases he apparently did deliver," the spokesman said.

Environmental Preservation Specialists Ltd. and Citation Laboratories Ltd., both incorporated in the State of New York, fell under suspicion in September when Richland Hills City Attorney Steven Stavron picked up the discrepancy between billing and goods received.

When Stavron demanded his money back from Glassner, he received two checks, each for $254. Both checks bounced and Stavron then contacted the Suffolk County District Attorney's Office, which immediately began investigating the matter.

50 States

The investigation revealed that municipalities in all 50 states had received bills from Glassner at one time or another in the two years the alleged scheme is believed to have gone on. The majority of victims were small towns that received and paid small bills, according to the district attorney's office.

Records found in Glassner's home showed that in the last four months, municipalities, churches and various sewer, fire and school districts in 30 states had received bills for pesticides and snow-melting pellets, according to the district attorney's fraud bureau.

Biloxi Pays

Besides the numerous small bills allegedly sent out by Glassner, a Mississippi town paid a bill for $400 worth of insecticides mistakenly received by its highway department. In addition, Biloxi, Miss., responded to bills by paying the Long Island man $7,000 in the last two years, according to investigators.

Fraudulent Acquisition

Furthermore, the microcomputer used to keep track of Glassner's billing schedule was allegedly acquired fraudulently from Radio Shack, according to Henry's spokesman. "He purchased the equipment at a show at a huge motel complex in Suffolk County earlier this year and then stopped payment on the check," the spokesman explained.

Glassner has not been charged in that matter, but could face grand jury action in connection with it, according to the spokesman.

Glassner's computer equipment included a Radio Shack TRS-80 microcomputer with a CRT terminal, line printer and one 70K-capacity disk, according to the district attorney's office. He also owns a cassette player and mini-disk player.

"Apparently he wasn't too expert in the operation of the equipment," Cornelius Crowley, assistant district attorney in the fraud bureau, said.

"According to our experts, the programming looked like it was just being set up by somebody that was learning," Crowley said.

Besides the computer equipment acquisition and billing scheme investigations, the fraud bureau is checking out an unrelated case indicating that Glassner may have fraudulently received checks from the Social Service Department during a three-year period ending in March 1978. If charged in that case, he would again face a grand jury.

In addition, Glassner has been on federal probation since 1977 for mail fraud, according to the district attorney's office.

At Glassner's Dec. 24 arraignment on the billing scheme charges, he entered a plea of not guilty and was jailed in lieu of bail, which he furnished the next day, the spokesman said. Although he is now free on bail, Glassner could not be reached for comment.

Defense attorneys and attorneys for the district attorney's office will meet on Feb. 5 to establish a plea and possibly set a trial date.

Eighteen of the 20 counts with which Glassner is charged are considered felonies, each punishable by four years. They are classified as third-degree grand larceny or second-degree attempted grand larceny, the spokesman said.

The other two counts are misdemeanors concerning a scheme to defraud. Each is punishable by up to one year in jail, the spokesman explained.

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U.S. vs. IBM Case Marks 10th Anniversary

(Continued from Page 1)

lucky, because this antitrust case — which went to trial on May 19, 1975 — has probably been the most expensive as well as one of the longest in history.

Several years ago, the government estimated it had spent $7 million on the case since it was filed. The actual cost is probably several million dollars higher than that, however — to the $7 million figure one would have to add the expense of the four years the Justice Department spent investigating IBM before the case was actually filed as well as the expenditures made since the estimate was made.

While IBM won't release any figures on its antitrust expenses, most knowledgeable observers estimate the company has so far spent three to five times what the government has expended.

Wednesday, the case's 10th anniversary, was the 585th day of the trial, which has filled 87,000 pages of transcript and during which 13,000 documents totaling millions of pages have been introduced. The government took almost three years to call 52 witnesses; IBM, which took over the case last April 26, is now on its 17th witness.

Worth It All?

Has it all been worth it?

"I just can't see where this can have any impact in 1985," one observer said after a day in court recently. "Supposing there's a decision by 1985, I can't see that anything will be changed."

And an observer from IBM noted that "it's a whole new ballgame today in the computer business. Look at all the Amdahls and plug-compatible and mini and micro manufacturers who weren't around 10 years ago.

"The whole industry has changed."

The IBM observer is right that the industry has changed, but market research statistics for 1978 show IBM with close to the same share of the market it had in 1968. While Wang Laboratories, Inc. and Amdahl Corp. may be around today, General Electric, RCA and Xerox have dropped out of the picture.

Another perspective on U.S. vs. IBM can be gained by looking back in history. The Sherman Antitrust Act was passed in 1890 with strong public support specifically to break up Standard Oil. The split into such companies as Mobil and Exxon didn't come until 1911 — 21 years later.

In the long run, the shareholders of Standard Oil were better off when that trust was broken up into its components; all of them are now successful and most are included on the list of the top 10 corporations in the U.S. today.

The U.S. vs. IBM case, while overdrawn, is probably important because it should resolve the "IBM issue" for at least a number of years to come. The government has taken IBM to court twice before on antitrust charges, but both of those actions were primarily settled out of court, which is less than a final resolution.

At least this time, both IBM and the government are getting their day in court. The result should therefore be longer lasting so new cases against IBM will not be filed every 20 years.

And while the IBM observer is correct that many of the issues being debated in the trial are already outdated, the crux of the case is less the specific issues than the overall conduct of IBM.

Commission Report

The case has also focused the attention of the nation's lawmakers — including that of the ex-peanut salesman — on the crying need to reform the antitrust laws so actions like the IBM case can be settled expeditiously and fairly in the future.

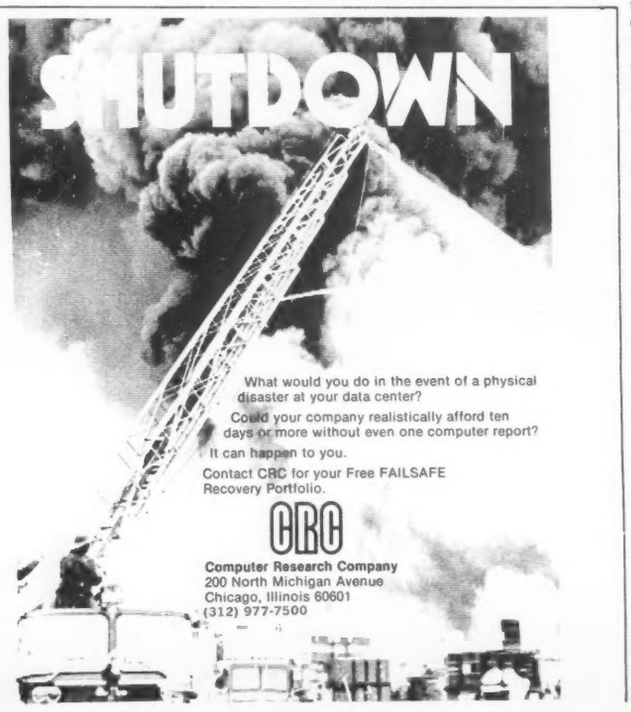
The inordinately long time it is taking to resolve U.S. vs. IBM led to a Presidential commission to study the issue. That commission issued a report last week.

The report makes two far-reaching recommendations. One would change the degree of legal proof required to show a monopoly so that it would be easier to prove a company guilty of monopoly. The second recommendation calls for stronger remedies — called "structural relief" — if a company is found to be a monopoly. The report said courts have been too lax and too kind in formulating relief in such cases.

So the case, while overlong and too expensive, promises to help the nation's lawmakers focus on needed changes in antitrust laws. Furthermore, it should help resolve once and for all the issues raised by IBM's size in the computer industry.

The drawback is that the case should have taken half the time at the outside and should be over by now.

It's too far along and too important to stop now, but hopefully U.S. vs. IBM will not take another decade to be resolved.



Arguments 'Preposterous'

(Continued from Page 1)

AT&T Long Lines Division.

The government "fails to take properly into account" a basic technological fact, AT&T said. Telecommunications services can be provided "most reliably and at the lowest cost through a single network, centrally planned and managed by an enterprise with research, development and manufacturing capabilities."

In fact, AT&T noted, "the government does not argue that telecommunications services could be provided at as high a level of quality or at as low a level of cost if the Bell System were fragmented." Instead, aside from a few generalized comments critical of the system's structure, the government's case is based entirely on a "litany of alleged instances of improper conduct" characterized by the government as monopolistic.

The bankruptcy of the government's arguments is compounded by its attempt to portray AT&T's conduct "outside the context in which it occurred," the company added. The Justice Department is "stripping significant events of their context in an effort to make reasonable conduct appear unreasonable."

AT&T charged that although the Bell Network is the product of a century of incremental, regulated development, the government's case is based on action said to have been taken by AT&T since 1968. At that time, the Federal Communications Commission (FCC), beginning with the Carterfone decision, "issued decisions departing from long-established regulatory policies," leaving AT&T "in a state of uncertainty."

The actions of the company over the last 10 years were by and large taken in good faith to protect the integrity of the Bell System, while attempting to follow the uncertain — and in some cases capricious — dictates of constantly changing government regulation, AT&T maintained. In any case, legal precedent is insufficient to convict AT&T of monopolistic practices, the company said.

To show monopoly power in any market, "The government must demonstrate that the defendants possess control over entry and prices in the market alleged to have been monopolized," the company's attorneys stated. In the telecommunications market, such power resides solely with the FCC, not with AT&T.

Answers Other Charges

The company in no way controls entry into the telecommunications market, "one of the most dynamic industries in this country," AT&T said. "Entry into the industry has occurred throughout the period covered by the government's complaint and continues to occur at an accelerated rate today."

AT&T cited the telecommunications proposals of "some of the largest, most vertically integrated companies in the country, including IBM and Xerox Corp.

"Insofar as prices are concerned, the facts conclusively demonstrate" that the company has not had control, AT&T stated. "Bell's prices have always been within the ultimate control of the regulators."

Addressing the Justice Department's charge that AT&T has monopolized the telecommunications equipment market of the Bell System through its Western Electric manufacturing subsidiary, the company said, "the government's charge amounts to nothing more than an attack upon a decision to make, rather than buy, needed equipment."

In addition, "relatively few general trade suppliers sought to meet the needs of Bell operating companies, and the equipment they did offer generally was priced higher or was of lower quality than equipment manufactured by Western Electric," AT&T said. But "the system sought the best and least expensive equipment regardless of source."

In 1974, the company's purchases of such "general trade products" were approximately $1 billion and have increased annually every year since, with the exception of the "recession year of 1975."

The charge that AT&T deliberately delayed providing facilities to other, competing carriers is particularly irresponsible, the company said. In fact, AT&T has "gone to extraordinary lengths to satisfy the needs of those carriers. The vast bulk of the delays that occurred in the processing of their requests for facilities and interconnections were directly attributable to those carriers' inexperience or incompetence, or both."

The same week AT&T's statement was delivered to the federal court, its attorneys told presiding Judge Harold H. Greene that the case could go to trial within the year if the government would agree to shorten its discovery process — the process through which it seeks from AT&T the documents and other evidence on which to help build its case. That process is now expected to last until sometime next spring.

AT&T said it is ready to go to trial and is not dragging its feet as the government has charged. The company told the judge it is ready to meet with the Justice Department's attorneys to stipulate the basic facts involved in the case.

Seven Components Identified

National Information Policy Shaping Up

By Jake Kirchner
CW Staff

WASHINGTON, D.C. — Privacy, fair recordkeeping, open access to and equitable distribution of information, awareness of international information concerns — these have become key concepts in the Carter Administration's evolving framework for a national information policy, according to Henry Geller, head of the National Telecommunications and Information Administration (NTIA).

In several recent public appearances, Geller, the President's chief adviser on information policy issues, presented these concepts as part of what he called "aspects to be considered in making information policy." Seven of these "aspects," or basic components, must be considered collectively when making any policy regarding the collection, storage, retrieval or dissemination of information, Geller said.

Addressing an information policy discussion group on Capitol Hill last month and again before a meeting here earlier this month of the American Library Association, Geller described in detail the seven aspects, which are the first fruits of a year-long NTIA project to define the parameters of information policy.

According to Arthur Bushkin, director of NTIA's Information Policy Program, the premise of the special project, which will culminate with a report sometime this spring, is that "there is an intellectually coherent set of ideas here that have to be tied together if one wants to make intelligent, consistent policy.

The report will be in two parts, he explained. "Part One would discuss in detail what we think the seven intellectual aspects of information policy are — seven policy areas that must be considered together. And it is our assertion that if you don't consider these seven aspects . . . then you're not making a coherent policy."

The second part of the project will take specific information issues, such as electronic funds transfer, electronic message services, libraries and tranborder data flow, and "show how those seven policy areas relate to each specific application."

Definition Developed

At this point, according to Bushkin, NTIA has developed the following definition of "information policy": "Information policy is a group of policies concerning the collection, storage, retrieval and dissemination of information, including the use of information technologies and the provision of information services in the furtherance of the collection, storage, retrieval and dissemination of information."

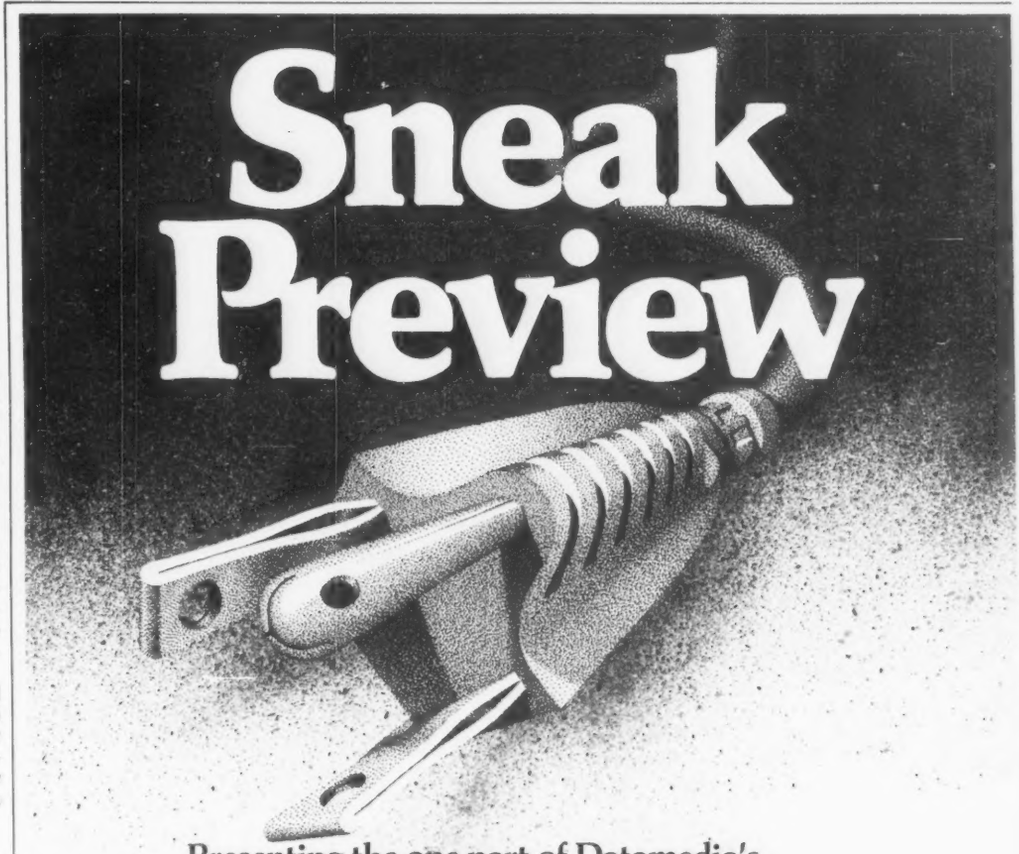
A further premise of the project, he said, is that one "cannot consider policy relating to the collection, storage, retrieval and dissemination of information without also considering the technology" that will facilitate them and vice versa.

In addition, when making information policy, all seven aspects of information policy developed by NTIA must be addressed, because any "policy conflicts will generally be between or among these aspects of information policy considerations relevant to the particular information activity or technology application being examined."

The Seven Aspects

As discussed by Geller and described by NTIA, the seven aspects of information policy are:

- Privacy: "Information about individuals should not be recorded without their knowledge and consent and, when recorded, should not be stored, used or disclosed unfairly."
- Open access to and dissemination of information: "Information should be widely disseminated, though not necessarily for free; information generated by and for the government should be open and accessible."
- The encouragement of the production of information goods and services: "Government should play a significant, affirmative role in encouraging the development of information goods and services."
- Managing information effectively: "Effective management of information goods and services is vital to the ability of information users to readily identify and locate relevant information at a reasonable social and economic cost."
- The tension between efficient and equitable distribution of information goods and services: "Information goods and services should be distributed across a broad economic and geographic spectrum. This will require a balancing of two sometimes conflicting principles, namely, efficient vs. equitable distribution."
- Market structure: "Except in cases of market failure, a market structure which fosters competition will assure the broadest availability of, and encourage innovation and productivity in, information goods and services."
- International concerns: "As international information exchanges and trade in information technologies are increasing, the U.S. must take account of the views of many other countries about information and must recognize they frequently do not share the same information policy assumptions as the U.S."



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By Using Video Camera, Mini

Service Quantifies Nonproductive Activities

By Marcy Rosenberg
CW Staff

SANTA ANA, Calif. — Next to a new productivity gauging technique that combines a minicomputer with time-lapse photography, the old efficiency expert's pen and clipboard begins to look like quill and parchment.

Known as Opt-Time, the technology was designed to isolate on film and quantify by computer nonproductive activities in business or industrial settings that can cost employers bundles.

Opt-Time was developed jointly by Loyola University and Manufacturers Resources & Planning, Inc., a consulting firm that specializes in developing fully integrated turnkey materials requirement planning systems.

The basic elements of Opt-Time are a video camera, a 64K-byte Microdata Corp. 3.1 version of the Royale minicomputer and a proprietary interface device that Manufacturers Resources & Planning developed to digitize light variations on the time-lapse film using six configured sensors, according to Jon M. Ament, vice-president of the consulting firm.

Search for Waste

Using time-lapse film at speeds between 10 and 18 seconds per frame, the consultants can go into a client company, capture a full workday's worth (from eight to nine hours) of employee movements and condense it to about three minutes of viewing time, Ament said.

Consultants then view the film at Manufacturers' headquarters to pick out wasted, redundant or unnecessary motions as people work, use equipment and move about during the work day.

The next step is to quantify these nonproductive activities, Ament said. This is done by placing sensors at those areas on the screen where the wasted movements occurred.

The sensors pick up, record and store light amplitude changes caused by people as they reach, grasp or walk by. A signal conditioner and converter changes these light variations into digital signals and time sensors convert the film to real-time.

This digitized data, when input to the host computer, actually carries information on frequency and duration of movements, Ament explained. His firm also uses Infoton Corp. Model 200-3 CRTs to input individual company parameters such as the number of workdays per year and hours per workday; the average number of employees and their salary rates; and allowable break and lunch periods.

The computer processes this information to come up with how much "nonproductive" activities are actually costing an employer in dollars and lists the specific elements — whether they be material transport, inordinate reaching or walking to a distant supply closet — in descending cost order.

Manufacturers developed the Basic software to be compatible with the Microdata hardware. A 50M-byte Winchester-type disk drive holds all Opt-Time systems and application software, while an 800 bit/in. tape drive serves as a backup.

Environment to Blame

"What clients usually find most valuable are the film and the descending order cost list," Ament said. In practically every study "we found that employees were not sloughing off — rather, management didn't provide them with the correct methods, tools or layout to be most productive. It would be hard for an employee to fake good performance for a whole day or two of filming."

Based on the Opt-Time studies, recommendations to increase productivity usually call for redesigning a work area or changing work methods to optimize production flow. "The more chaotic a work environment and the more random its activities, the more cost savings we can effect," Ament maintained.

He cited average cost savings of more than 47% in industrial settings and more than 40% for administrative or clerical departments through Opt-Time.

"We would be hard-pressed to get a 30% productivity gain on an assembly line," he added, "because the industrial engineering community has always specialized in the manufacturing environment. However, more than 90% of industry does fall within our domain — for example, administrative, clerical, shipping and receiving, high R&D and virtually any operation that goes through high product mix changes."

Since its introduction in February, 30 to 40 companies outside the consulting firm's regular client base have used Opt-Time, including NCR Corp., Burroughs Corp., Pepsico and Rohr Industries.

Fair to Employees

Compared with other techniques that have been used to measure productivity, Ament maintained, Opt-Time is fair to employees. "What we measure are nonproductive elements of an entire operation," he said, rather than measuring one person's discrete body movements against predetermined standards.

"Besides individual body movements, we look at people's motions relating to machine use and to material handling," he added, because productivity is a factor not only of human performance, but also of types of equipment and materials and how the work environment dictates their use.

Before filming, Ament noted, "we show employees other time-lapse photos to acquaint them with the technique." He acknowledged, however, that this is done at the discretion of the employer.

The Opt-Time study takes about a week to complete when filming with multiple cameras, but since "we evaluate our data from films at an off-site location, we don't disrupt employee work schedules," Ament said.

Another advantage, according to Ament, is that Opt-Time provides "a reconstructible record. Management can validate our computerized data by looking at the film, and many employers show the film to employees to get their recommendations."

Opt-Time costs $20,000 to $25,000 for a company with 300 employees, Ament said. His firm also offers a $3,400 pilot evaluation of only one department within a company.

Manufacturers' Resources & Planning is at 1430 Suite M, S. Village Way, Santa Ana, Calif. 92705.

Technique Verifies Snag At NCR Work Center

By Marcy Rosenberg
By a CW Staff Writer

SAN DIEGO — NCR Corp. used the Opt-Time productivity measuring technique at one of its work centers about seven months ago to investigate poor material flow — a problem thought to be caused by the environment rather than employee problems.

"If we had suspected an employee problem, we would not have used Opt-Time," according to Tom Kane, NCR's manager of manufacturing engineering. "It is not part of our people management style to use a mechanical measuring device to gauge employee work performance because it is risky, could be misleading and depends largely on who is interpreting it."

Opt-Time was developed jointly by Loyola University and Manufacturers Resources & Planning, Inc. of Chicago.

What Kane did suspect at NCR's printed circuit board test center was an engineering problem which would require environmental design changes.

"We thought we had a handle on the problem, but needed some way to document and sell our recommendations to management. The visual feedback the Opt-Time film provided did the trick," he explained.

Inefficiencies at the 50-employee, 5,000 square-foot test area included heavy traffic; excess material flow requiring too many people to complete one job; and too much time spent chasing down parts and waiting for reworks on faulty boards, Kane said.

The Opt-Time evaluation took three days and evoked "no reaction at all" from employees, according to Kane, who admitted that "we didn't really confide to them our plans to implement the technique because we wanted to be sure to get accurate readings."

Based on Opt-Time results and Kane's recommendations, NCR will spend about $10,000 to redesign the work area and optimize the total production flow. Plans are also "to replace the batch system we now use to record board failures with an on-line system."

When the 30 or so proposed changes take effect, he added, "we expect to increase productivity by about 20%."

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NTIA Drawing Up Private-Sector Privacy Act

WASHINGTON, D.C. — Legislation to implement President Carter's "privacy initiative" is now being hammered out by the National Telecommunications and Information Administration (NTIA), a government official close to the effort said.

The initiative will deal with the privacy of medical, credit and banking records, addressing one area at a time [CW, Dec. 11]. According to an NTIA staff member, the agency will also develop legislation covering personal privacy as affected by other types of data gathering, including research and statistics.

"The basic issue" behind privacy legislation covering research and statistics, he said, is that "information collected for research and statistical purposes should not be used to make decisions about people."

As the Privacy Protection Study Commission recommended, there should be a "functional separation" between the intended use of information gathered by the government and any possible subsequent uses for such data, he said.

'Big Push' Planned For DP Crime Bill

The Federal Computer Systems Protection Act, introduced in the last session of Congress by Sen. Abraham Ribicoff (D-Conn.), will receive a "big push" when it is reintroduced in the early weeks of the 96th Congress, which convened last week, according to a staff member of one Senate committee.

Another congressional aid recently expressed surprise that the measure did not pass last year in view of its strong bipartisan backing on both sides of Capitol Hill [CW, Dec. 25-Jan. 1].

One reason for the bill's slow going, he theorized, is that the DP industry does not fully back it.

While not saying so explicitly, many in the industry might have felt the bill, which would constitute the "first instance of government regulation of the data processing industry," would open the door for further and more restrictive regulation at a later data, according to the congressional staffer.

In any case, the bill will have even stronger backing this time around, he added.

DOT Testing System For Weather Data

Testing has begun on a weather information system that uses a computer-generated voice to apprise pilots of wind conditions and provide accurate altimeter settings, the U.S. Department of Transportation (DOT) announced earlier this month.

The system, called Wave — for Wind, Altimeter Voice Equipment — is being tested at the Frederick, Md., municipal airport by the Federal Aviation Administration and the National Oceanic and Atmospheric Administration.

Wave consists of sensors that register wind speed and direction and barometric pressure.

The data is analyzed by a computer that generates a weather announcement once every minute over a radio navigation aid, DOT explained.

Washington Update

Annual NCIC Purge Performed by FBI

Just as the swallows annually return to Capistrano, early this month the Federal Bureau of Investigation conducted its annual purge of the National Crime Information Center (NCIC) computer files.

Performed routinely at the beginning of each year, the purge is described as a "housekeeping procedure" that eliminates old or outdated information in the more than 7,580,015 records in the NCIC data base, according to an FBI source.

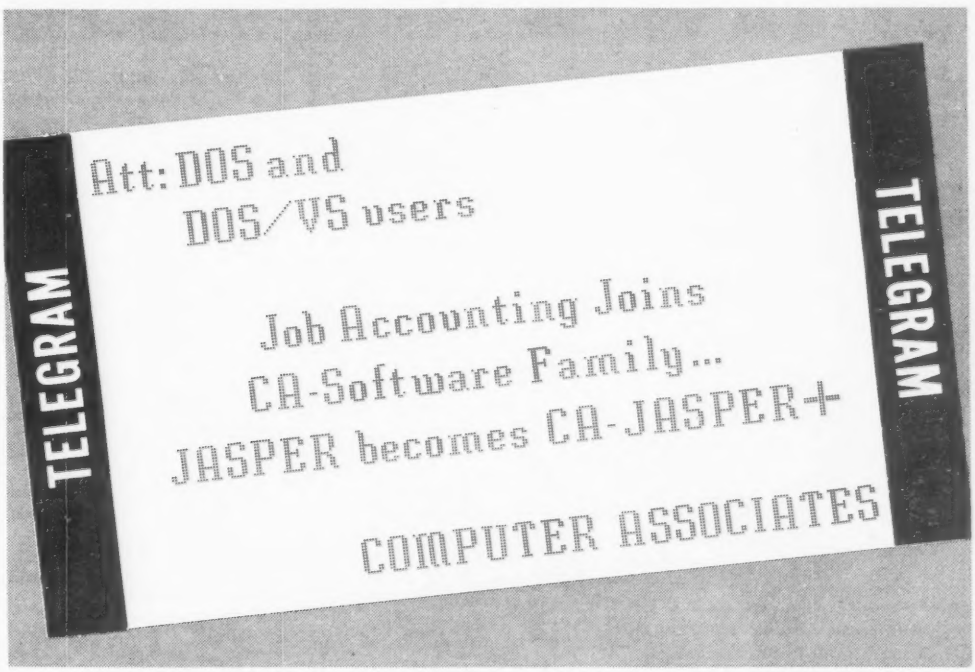
The purging program removes certain data from the files based upon established FBI criteria and time limits. Basically, those records that have "lived their life" are removed from the file, the source said.

Among the records removed by the purge were all stolen vehicles and vehicle parts entered in 1974, all stolen nonexpiring license plates entered in 1974, all stolen articles entered in 1977, all recovered guns entered in 1976 and all stolen boats entered in 1974.

Missing and wanted person records in which the only searchable identifier is the license plate field of expiration code 77 were also deleted from the file, but a listing of these records was printed out and distributed to the originating law enforcement agency.

Access to the NCIC computerized network by participating police departments was not hampered by the purging process, the FBI said.

The annual chore took place on a Sunday for the convenience of the DP section.



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Group Training DP Students in Harlem Garage

By Marguerite Zientara
CW Staff

NEW YORK — It may look like a broken-down garage from the outside, but inside unskilled and disadvantaged men and women are learning programming, computer operation and keypunch skills in rooms filled with sophisticated computer equipment.

That garage, in Harlem, houses the Opportunities Industrialization Center of New York, Inc.'s (OIC) Computer Training Center. Since 1972 more than 1,000 trainees have completed free courses in DP at OIC and gone on to jobs ferreted out by the center's placement office.

"All our students can be placed in jobs if they want to be," according to Sam Anderson, OIC manager of job development.

In addition to job placement, the courses lead to "positive termination" — going on to college — for 10% to 15% of OIC students, Anderson noted.

The center here is an outgrowth of OIC of America, "a national effort to help people help themselves," according to an OIC spokesman. The nonprofit group was founded in Philadelphia in 1964 and came to New York three years later.

Aimed at providing opportunities especially for minorities and the underprivileged, the program is open to anyone who wishes to attend. About 15% of the center's students are college-educated when they begin a course of study at OIC, Anderson said, while the rest may or may not have completed high school.

The course of study is free to students, as is the placement service, since OIC is funded by city, state, federal and private corporate grants, Anderson noted. Students presently find their way to OIC's doors primarily through word of mouth, although OIC plans to begin advertising.

In addition to DP, the school offers courses in heating, ventilation and air conditioning, house repairs, food service and secretarial skills. In those areas there is on-the-job training as well, with a guaranteed job at the site after the training period is completed.

Appearance Deceiving

As for the shabby appearance of the building that houses the computer training center, Anderson explained, "The center is located in a high drug use area and, as it is, the telephone wires are ripped off about once a month by junkies who sell the copper. If they knew what was inside, they would have a field day."

Inside are an IBM 370/135 and a System/3 Model 10, both with appropriate peripherals, as well as keypunch equipment. On the equipment, donated by IBM to the school, students learn the skills necessary to get jobs.

Job placement goals for June 1978 to June 1979 are 214 keypunchers, 40 programmers and 30 computer operators. Eighty-five percent of the students placed in jobs remain there, Anderson said.

Students who wish to take the computer programming and computer operation courses must have a 12th grade education or its equivalent. Programmers may specialize in either large or small systems.

In large systems courses, programmer trainees are taught DOS/VS, OS/VS ANS Cobol and BAL, while in small systems courses trainees learn RPG-II as well as ANS Cobol. These courses last 12 weeks.

Computer operation trainees learn to operate the Model 135 DOS/VS with Power/VS and OS/VS1 with JES. They are introduced to the System/3 with teleprocessing in a course that lasts nine weeks.

The center also offers training that prepares students to take the high school equivalency test.

OIC's keypunch course, given at a Brooklyn facility, teaches students to use IBM Model 129 keypunch machines and gets students familiar with the basic operations of the Model 5496 data recorder and the Model 082 card sorter. The course, which emphasizes practical job applications and includes continuous testing, lasts eight weeks. Students must know how to type.

Two instructors teach programming, one teaches computer operation and six teach keypunch, Anderson said.

Job Placement

OIC's job placement success can be largely attributed to the ongoing aggressive efforts of the organization's job development department, which includes one specialist and two aides in the area of DP. These specialists develop and maintain contacts with corporations and educational institutions with the aim of placing OIC graduates in available jobs.

More than 40 companies have hired DP graduates from OIC, including IBM, E.F. Hutton, New York Telephone, United Parcel Post, Manufacturers Hanover Trust, Chase Manhattan Bank and Irving Trust Co., according to Anderson.

A technical advisory committee composed of volunteers from various interested corporations as well as OIC personnel helps OIC administrators determine the needs of the computer industry "so the training programs can be geared to the demands of the real world," Anderson explained.

A subcommittee arranges a Career Day Program, every year, usually in February or March, which brings together students and representatives from prospective employers. Information is exchanged and students are interviewed and recruited.

Thirteen companies have representatives on the advisory committee, including Con Edison, Grumman Data Systems, Chemical Bank, International Telephone & Telegraph and NCR Corp.

Peripherals associated with the 370/135 include IBM 3411 and 3410 9-track cassette tape drives, two Model 3340 disks, each with 70M bytes of capacity, a 3525 card punch, a 3505 card reader and a 60 line/min Model 1403 printer.

System/3 equipment includes a 3742 data station, a 5424 multifield card reader, a 1442 card reader and punch, a 40 line/min Model 5203 printer and two 5444 cassette disks. A Model 3275 CRT is not presently in use; the school is in the process of developing training applications programs for its use.

Data entry equipment includes a Model 3742 key-to-disk data entry station, a Model 129 data recorder and verifier, a 029 card punch and 5496 and 9610 data recorders.

As a school spokesman said, the System/3 Model 10 "has pretty much had it," and OIC is trying to upgrade to a System/3 Model 12 or 15. He noted that IBM has always upgraded the equipment in the past and expects it will come through again soon.

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Ex-CIA Head to Speak

WASHINGTON, D.C. — William Colby, former director of the Central Intelligence Agency (CIA), is among the scheduled speakers at the Second International Conference on Transnational Data Flows (TDF-79), to be held here at the Mayflower Hotel June 18-30.

The conference will focus on the economic impact of transborder data flows on trade, the job market and data base services.

The Communications and Information Institute is TDF-79's organizer and sponsor.

Slated speakers include Maurice Crawford, director of the U.S. State Department's Advisory Committee on Transnational Enterprises; Frits Hondius, head of the Council of Europe's Division of Public Law; Hugh Donaghue, vice-president of Control Data Corp. and John Eger of Lamb, Halleck and Keats, a Washington, D.C., law firm.

Further information is available from TDF-79 coordinators Donna S. Ahrend and Mike O'Bryant through Information Gatekeepers, Inc., 167 Corey Road, Brookline, Mass. 02146.

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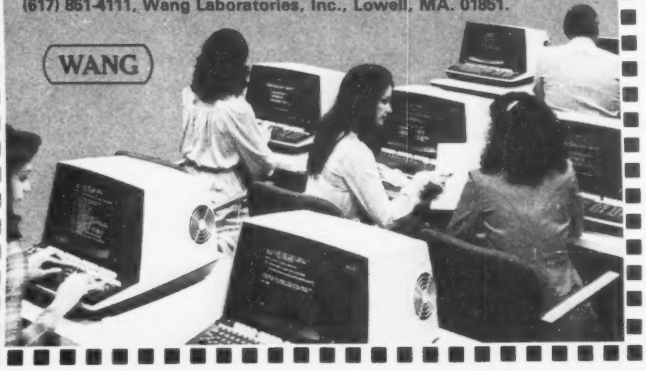

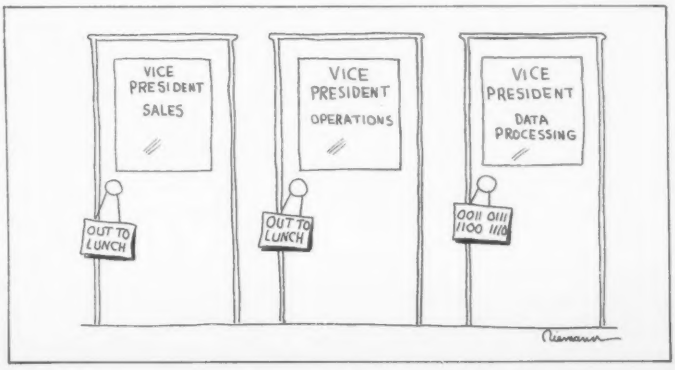

Test Finds Turnaround Much Quicker

Immigration Service to Decentralize Visa Work

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Turnaround time for immigrant visa processing has been cut from 90 days to five days in a field-tested computerized system of the U.S. Immigration and Naturalization Service (INS) here and in Baltimore, Md.

Visa information has been computerized for some time, but in a centralized operation. The new plan — to be implemented by February in New York, Newark, Chicago, Detroit, San Francisco, Los Angeles, Miami and Houston (and later in Boston) — will decentralize the process and eliminate paper handling between the central office here and agency field offices.

Under the current processing system, the visas are mailed from the port of entry of the permanent resident alien to the INS central office here, where "some significant manual processing goes on," according to Allen Shelton, computer systems analyst for INS. The manual processing includes coding of certain information, verifying the code, putting the visa and associated information into a folder and assigning its subject an alien number.

"At that point, certain pertinent information is entered into our central computer system, which is the master index system," Shelton said. That information includes the immigrant's alien number, all names and aliases, data and country of birth, class of admission, date and port of entry, U.S. address and the district office that has jurisdiction over the alien's intended place of residence.

After the information is entered into the central computer system, the alien's file folder is mailed to the district office.

Local Data Entry

"With the new plan, we intend to have the port of entry mail the file folder directly to the district office, or Files Control Office, and have it do the processing and enter the data through terminals at that point," Shelton said. "That way, the district office will have access to that alien's file within about three days' mailing time from the port of entry."

With terminal access to the central data base, any office will be able to find out the location of a particular file at any time. "Quite often, the way the system works now, an immigrant will enter the country and indicate his intended place of residence is, for example, New York. If he then moves to Chicago and goes into the Chicago office for his dealings with INS, the office needs his file in order to adjudicate applications and for other documentation," Shelton explained.

Right now the Chicago office would look for the file by telephone, telegram or mail, he said, but automated inquiry will give it the information immediately.

Once a traditionally slow, paper-laden government agency, INS has increasingly moved toward computer automation in the last year and a half, thanks to IBS Commissioner Leonel Castillo, who sees yet more computerization in the works.

In an agency that processed 460,000 permanent resident immigrants in 1977 as well as about eight million temporary visitors in the same year, automation was a concept long overdue. There had been little previous automation in the department because of the red tape involved in getting government approval and funding and in ordering and installing equipment, according to Vern Jervis, public information officer for INS.

In addition to the legal immigrants processed each year, more than half a million illegal immigrants are arrested annually; more than 160,000 immigrants apply for citizenship per year; and as citizens, immigrants can apply to bring other family members into the country, as several thousand per year do, Jervis explained. All of these transactions entail paper processing, which in the past was done manually in many cases, resulting in long waiting periods for the public.

Model District Office

The feasibility and efficiency of automation within INS is now being tested in Houston's district office, the most automated INS office in the country, according to Jervis.

Houston has such capabilities as applications and petitions tracking to help answer status inquiries that might come, for example, from a citizen applying to bring family members into the country. The system tracks applications and petitions from the time the application fee is paid until a decision is made on the case, according to Robert Schultz, acting director of the Houston office.

In addition, the Houston system tracks the 80,000 alien files housed there, from the file room to the various departments where it mght be, for the convenience of adjudicators, investigators and other workers in the district office.

The alien file-tracking system, based on a wand chargeout system and barcoded labels affixed to each file, indicates what person in which unit has a particular file checked out. In the previous manual chargeout system, a person filled out a paper indicating his name, date, file number and its destination.

"There's a whole raft of things in store for us here," Schultz said, including deportations docket control, an attempt to eliminate the manual processing of 5,000 to 6,000 cards indicating the status of deportation cases.

The future may also bring automatically printed "call-in letters," telling people they are scheduled for an inter-

(Continued on Page 15)

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Mini-Based System

'Art Cop' Starts System to Trace Stolen Works

By Cheryl Morrison
Special to CW

NEW YORK — A detective and an associate who founded an art registry service have developed a computer system that enables police to trace stolen and recovered artwork and antiques.

The detective, Robert Volpe, may be the only police officer in the U.S. who works exclusively on crimes involving antiques and art.

"Art theft is second only to narcotics traffice as an international crime," according to Volpe, who took on the assignment seven years ago.

One of Volpe's frustrations as an art cop was the lack of communication about pieces of art that are stolen in one city and recovered in another. If a policeman in Houston found a painting among a cache of stolen goods, he was unable to trace it — or even determine if it had been stolen — unless he happened to know beforehand where it came from.

If that same cache included a television set, the officer could check with the National Crime Information Center (NCIC) and find out in a few seconds if a set with the same serial number had been reported stolen anywhere in the country.

"Computer systems like NCIC are geared to serial numbers," Volpe said. "I checked with NCIC, and I was told that stolen artwork couldn't be handled in computer language because it doesn't have serial numbers."

Art Central Formed

So Volpe got in touch with Alan Baer, who founded The International Art Registry, Ltd. eight years ago. Together they developed Art Central, which does for art and antiques what NCIC did for televisions and automobiles.

Art Central actually is just an extension of what Baer's registry already had been doing. The registry is a computerized system that enables collectors and dealers to protect themselves against fraud and keep detailed records of an artwork's ownership, aids in the recovery of registered pieces that have been lost or stolen and sometimes qualifies owners for lower insurance rates.

The keystone of Baer's registry system is an identification technique developed by two London bobbies. It requires that each registered artwork be photographed and that some section of the photgraph be blown up so the texture marks can be read like fingerprints. The coordinates of the blown-up section are recorded and kept confidential.

If a policeman recovers a registered painting that had been stolen, the registry can determine if the painting is the original or a fake by finding the spot determined by the coordinates and checking it against the blow-up.

Mini-Based System

To register an artwork, the owner pays a percentage of its value. So far, 10,000 works are in the registry, and data about them is fed into a Wnag Laboratories, Inc. 2200 minicomputer system equipped with a Model 2220 CRT keyboard and Model 2201 printer.

Art Central uses the same equipment, and registry personnel can use the CRT to call up descriptive information that will aid police in identifying a found piece of art.

Volpe developed a printed form that police can use for reporting an art theft. The form calls for the information needed to categorize a piece of art, listing specific characteristics of which someone unacquainted with art might not be aware.

The form asks whether the stolen piece was a painting, drawing, print or sculpture. Each category is broken down further; if it's a painting, the reporting officer can check whether it's done in oil, watercolor, tempera, gouache or acrylic, for example, and whether it's painted on canvas, board, paper or something else.

There's an additional category on the form for furniture, tapestries, musical instruments and other objects that might be antique or rare.

In addition, the form calls for information about the artist, the title of the work, the country and date of origin, whether the work is signed and dated, its dimensions, its subject and its value.

Information from the form is fed into the mini, and the report is assigned a control number.

Now that policeman in Houston can call Art Central and find out in eight seconds if a painting of that description was reported stolen from anywhere in the world. If the painting also was registered with Baer's International Art Registry, of course, more definite identification can be made later.

Dramatic Recovery

Although Art Central is just getting under way, it already has aided police in returning numerous stolen works of art to their owners. Volpe has a dramatic story about how it helped him in a recent case.

After months of undercover work, Volpe met with some thieves who had offered to sell him a stolen art collection he had tracked down. Volpe was posing as a dealer's representative.

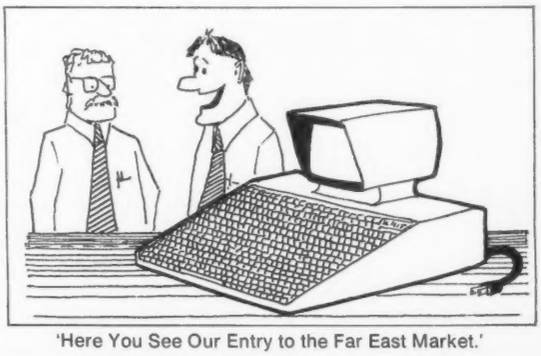
The usual police procedure is to announce that the sellers are under arrest as soon as the transaction is made. That way, police have the stolen property that they can use as evidence and return to the owner. Police refer to these occasions as "buy-backs."

During this particular buy-back, the thieves offered to sell Volpe several pieces of art in addition to the collection he'd been tracking down. Volpe didn't know, of course, if the works were stolen, and he had only 15 minutes to give the sellers their answer.

He excused himself for a minute, saying he had to call the dealer for an authorization. Instead, he called Art Central, described the additional pieces and learned in eight seconds that their theft had indeed been reported. He also learned their value so he could negotiate more effectively.

Volpe agreed to buy the extra pieces. When he had them in hand and the backup police team moved in to arrest the thieves, they had a stonger case for prosecution because they had even more evidence than they'd bargained for. And several more priceless pieces of art were returned to their owners.

Art Central's effectiveness obviously depends on whether police are careful to report all losses to it and check it for information on all recovered artwork.



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Conference to Feature 'Peter Principle' Author

WALTHAM, Mass. — International Data Corp.'s (IDC) spring Executive Conference on Automated Business Communications, slated for April 1-4, will feature Dr. Lawrence Peters, author of *The Peter Principle*, as its wrap-up speaker.

The conference, which will be held at the Camelback Inn in Scottsdale, Ariz., will bring together user and vendor executives and feature IDC market research presentations, leading-edge user case studies and technology discussions by representative vendor companies.

There will also be general discussions of the problems facing both users and vendors as they prepare for the automated office. In addition, IDC will focus on the similarities and differences between large and medium-size organizations.

Also scheduled to speak at the conference is John McLaughlin, director of Harvard University's Program on Information Policy Resources for the Postal Areas. McLaughlin will explore the communications problem between business and individuals, providing perspective to IDC research on communications within an organization.

Dr. James Jewett, head of Vanderbilt University's programs on telecommunications and president of the Telco Research Group, will examine the design of combined voice and data networks for unified communications.

There will be other speakers as well as presentations by IDC's senior staff.

The conference registration fee is $750; additional team members from the same organization can attend for $495 each. Members of IDC's Continuous Information Service attend such IDC-sponsored conferences free.

Further information is available from IDC's corporate headquarters at 214 Third Ave, Waltham, Mass. 02254.

INS Plans Decentralization

(Continued from Page 13)

view, as well as automatically printed requests for visa numbers. Visa numbers may be required in the cases of people changing from nonimmigrant to immigrant status — for example, aliens who visit the country and then decide to stay, Schultz explained.

If Houston proves a successful testing ground for such automation, other INS district offices may follow suit.

"Through computer automation, it is our commissioner's intent to greatly improve the service provided by our agency to its public," according to Shelton, "and our approach is to facilitate or change the manual processes with an eye to providing better service."

INS computerization is centered around a 2M-byte IBM 370/155 located at the Department of Justice Data Management Services Center here. While plans call for connecting district offices with the central data base via communications lines, presently only Baltimore is on-line. Divided between Baltimore and Washington are 60 Bunker-Ramo Corp. Model 2200 intelligent terminals. Houston uses a Raytheon Co. PTS-1200 minicomputer with 128K of memory and Two Centronics Data Computer Corp. 300 line/min printers. An Intermec bar code label printer and five Intermac bar code readers are used for the alien file tracking system.

There are 10 CRT terminals associated with the PTS-1200 system, and four 5M-byte disks for storage, two fixed and two removable. Communications lines connect Houston with the Washington central office, but a modem problem prevents the two from communicating at this time. The problem is expected to be cleared up this month.

Equipment to be installed in other district offices will be 96K-capacity Four-Phase Systems, Inc. System 450 minicomputers and 45 char./sec Diablo Systems, Inc. printers.

Workshops Set On DP Security

DIX HILLS, N.Y. — Methods for safeguarding DP facilities, computer systems and voice and data netwroks will be discussed in Florida next month and in the Washington, D.C. area in April at workshops given by Data Security Workshops, Inc. (DSW).

The identification of administrative and technical DP problem areas, operational aspects of securing facilities, privacy legislation and personnel considerations will be covered, DSW said.

Other topics will include protection of electronic funds transfers (EFT), data acceess and software security, risk management, backup and contingency planning, cryptography and DP auditing. The EFT discussion will feature a detailed look at the "anatomy of bank DP operation," DSW noted.

Among those scheduled to speak at the workshops are Adolph F. Cecula Jr., U.S. Geological Survey security officer; and Edwin Donlin, National Bank of North America security manager.

Both the workshop in Orlando, Fla., on Feb. 19-22 and the workshop in Arlington, Va., on April 9-12 cost $525 per registrant. Additional information is available from the Registrar, Data Security Workshops, Inc., 6 Swarthmore Lane, Dix Hills, N.Y. 11746.

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Treat Employee Files Carefully Top Firms Urge

By Marguerite Zientara
CW Staff

NEW YORK — Companies setting policy on storage and use of employee information should "put themselves in the place of" the employee and give highest priority to accuracy, fairness, confidentiality and a minimum of intrusiveness, according to a policy paper released last month by The Business Roundtable.

Increasing amounts of such personal data are being maintained by DP departments as part of their recordkeeping functions.

The Business Roundtable is an association of the chief executive officers of about 190 major American corporations — including IBM's Frank T. Cary — that focuses and acts on public issues.

In its paper, entitled "Fair Information Practices, A Time for Action," the Roundtable stated its beliefs that:

• The foundation for reviewing and implementing the recommended practices "should be firmly based on a respect for the dignity of the individuals."

• The collection, use and dissemination of employee information should be conducted in an "open, understandable manner," and the rules and reasoning behind such collection should be made available to all employees and job applicants.

• Companies should establish formal policies outlining the proper handling of employee information and should communicate those policies to their employees.

• Each employee should be permitted to inspect for accuracy the basic personnel documents that directly impact his individual employment status except for those documents that have been specifically excluded from disclosure.

Possible Exclusions

Exclusions may include records pertaining to more than one employee as well as archival data on long-term employees. Exclusions may also be made in the case of ongoing criminal investigations, according to Jack Osborne, principal consultant to the 17- member committee that prepared the paper and director of regulatory compliance for TRW Credit Data of Orange, Calif.

"What we're trying to do is get around the whole issue of cost," he explained. "It becomes very, very expensive to make a blanket statement that an employee can see everything because, for example, archival data may be stored at a different facility or in a manual storage system."

When archival data is used, however, a copy of the data should be put in the employee's personnel folder so that it can be examined, Osborne noted.

Additional Suggestions

In addition, the paper suggested that:

• Sensitive medical information be passed to the employee through his personal physician to ensure that the information is not misinterpreted or confused.

• In any case of exemption from disclosure of information or practices, an organization has a duty to "honestly and clearly" inform the employee of the action it takes.

• An employee should have a formal means of pointing out and requesting correction of any errors he discovers on records he has been allowed to examine.

• All releases of personal information both within and outside the boundaries of the employing organization "should be strictly controlled by written procedures, closely monitored for compliance" and in general should take place only with the employee's consent.

• Only relevant and accurate information should be used to make decisions impacting the employment status of individuals.

• "Employee understanding and knowledge of company practices are crucial ingredients for the success of an employee information policy." Explanations should be clear, remedies easily accessible and communication encouraged.

The Roundtable believes that insurance records, medical records, conviction records and security records — such as those pertaining to internal investigations or government clearances — should be maintained separately from an employee's general record and that careful restrictions should be placed on their use.

It also believes that organizations should "neither seek nor use arrest records for the employment process, except as specifically required by law or government contract," and should ban the use of truth verification devices in the employment process.

Basis of Recommendations

The Roundtable task force based its recommendations on an in-depth study of the Federal Privacy Protection Study Commission's 1977 report entitled "Personal Privacy in an Information Society."

Endorsing the privacy commission's recommendation that industry be allowed the opportunity to voluntarily comply with the commission's suggestions, the Roundtable further recommended that a period of voluntary compliance be established to last from three years to five years, followed by a federal government review.

The policy paper was previously prepared by representatives of 17 major corporations during a nine-month period and was reviewed for viability by the general counsel, vice-president of personnel and head of security for each of those corporations.

Ultimately, 46 chief executive officers from the Business Roundtable endorsed the document, making the paper the official policy of all 190 Roundtable members, according to Osborne.

"In drawing up the document, we tried to take into consideration how we could make it meaningful to small and medium-size businesses, even though The Business Roundtable represents mostly large companies," he pointed out.

Among the 17 task force members, two were from computer companies.

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School District Gets 'F' In Fundamental Arithmetic

By Jay Woodruff
CW Staff

COLORADO SPRINGS, Colo. — An error in the way a school district here reported its student enrollment to a computer is one reason why the district owes the State of Colorado about $575,000.

El Paso School District 11 mistakenly counted a group of students twice and received aid to which it was not entitled. The money will be repaid over the next three years.

"We noticed the error when we did our audit review of the district in November," according to Stanley Anzick, a Colorado Department of Education auditor. "I'm sure the school would have caught it if it had taken a close look at the figures before they were submitted."

The miscount was caused partly by the district's staggered schedule, instituted to handle an increasing student population without constructing another school. The schedule allows as many as one-third of the students to be on vacation at any one time, according to District 11 Treasurer Dave Eberhart.

Those students on vacation during October were entered on the computer under the wrong code and were counted as present at school, Eberhart explained. When the error was noticed, the students were reentered under the correct code, but the entry under the incorrect code was never erased.

The fault occurred at the district's computing facility, which is shared by the El Paso county government. An employee there, "who is no longer with us," made the incorrect entry on the district's Digital Equipment Corp. Decsystem-10.

Someone made a previous error in reporting the attendance figures in 1976, but in that case a computer was not involved, Eberhart recalled. A total overcount of 522 students for 1976 and 1977 caused the district to receive $360,000 more in 1977 and 1978 than it was entitled to receive.

To determine entitlement, the district averages the current count of students against the counts for the preceding two years, so it will have to cut a total of $575,000 from its 1979 budget to compensate for the overcount.

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Whole Career in DP

Programmer Retiring After 41 Eventful Years

By Rita Shoor
Special to CW

CHICAGO — DP has finally come of age. We have been around long enough to have a retiree who is a member of a very select group. He is Hugo Wassell, a programmer/analyst with Benefit Trust Life Insurance Co. here.

What makes Wassell so unique? Just this: He will retire from his job on Jan. 31 at age 65 after spending his entire working career — all 41 years of it — in DP. Wassell has been in the front lines — from pre-World War II card sorters and tabulating equipment right up to his current environment, which includes a Control Data Corp. (CDC) 3400 and on-line CRTs.

Before he reaches the point where midnight phone calls, due dates, appeals from unhappy department heads about report formats and unreasonable requests from harried managers do nothing more than make him smile reminiscently, I asked him to give us some information on changes in the DP scene from then to now.

Silence Is Golden

Wassell's career began in 1937. He was hired to operate the card sorter and tab machines at the Hall Printing Co. According to his account, he received the job because his father assured the manager of Hall's accounting department that "my kid knows how to keep his mouth shut."

This was of primary importance because the previous tab operator had had an unfortunate tendency to broadcast such pertinent data as payroll information to any employee who cared to listen.

Did Wassell actively seek this particular job? "Believe me, when I got out of high school, one was lucky to get an application to fill out," he said.

The current demand for almost any type of technical knowledge and/or expertise makes that statement rather difficult to believe. But keep in mind that the speaker graduated from high school in 1931.

How many of today's programmer/analysts can recall firsthand the Great Depression? Inflation may mean your paycheck isn't going as far as it did. In a depression, things become much less sophisticated. You don't have any paycheck to worry about.

Army Career

After several years with Hall Printing, Wassell was "selected by my friends, neighbors and Uncle Sam" to serve in the U.S. Army. After subjecting him to a battery of aptitude tests at the Army Institute in Madison, Wisc., his superiors promptly informed him that he "should work with electrical or mechanical office equipment."

In completely atypical fashion, the Army managed to follow its own advice. Wassell spent his time in the service as an operator of various types of tabulating equipment.

After his 1945 return to civilian life, Wassell and Hall Printing had some difficulty in coming to terms about his proper value (a not-uncommon occurrence even in today's technician-starved marketplace). At that point, he accepted a position in the tabulating department of the Benefit Trust Life Insurance Co. For the next 15 years, life progressed fairly quietly.

Then, in 1960, fate and technology joined forces to bring a major change into his life. Wassell became a member of a team that performed the feasibility study to determine if a computer could meet Benefit Trust Life's rapidly expanding DP requirements.

Note that the initial decision to be made was whether a computer would be useful. The study was executed in 1960. Just 18 years later, the very idea of any large company functioning without the information retrieval and storage capabilities provided by DP technology has become ludicrous.

When the decision was made to go with an IBM 1401 system, Wassell was selected to learn the Symbolic Programming System and 1401 Autocoder. Some two weeks later, he was a full-fledged programmer.

In comparison with today's training programs that average two and one-half months to three months in duration, Wassell's accomplishment seems staggering. After reviewing some 1401 programs that are still lurking about in various installations, one is tempted to call it "miraculous."

What was the environment of this application programmer like in 1962? It was completely card-oriented. While a programmer trainee today speaks airily of "megs of core," Wassell and his contemporaries worked to break a billing program into separate functioning modules because the first program simply wouldn't fit into the 16K bytes that were available.

As recently as 1968, programmers were delighted by the speed and storage capacity of magnetic tape. Why not? They were comparing the results of a seven-hour tape sort with the 27.5 hours it would take to sort the same data on punched cards.

In the late '60s, Benefit Trust Life acquired its CDC equipment. Wassell obligingly went from second-generation Autocoder to third-generation Cobol. Any problems with this change?

(Continued on Page 18)

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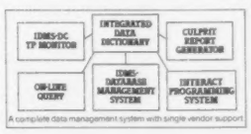

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Journal Seeks Articles On Computer Crime

LOS ANGELES — The National Computer Crime Data Center here has issued a call for papers on computer crime to be published in a special issue of **Computer Law Journal** slated for publication in May.

According to the center's director, Jay Becker, the following topics are suggested for the issue:

- Computer crime and international data flow.
- Computer crime: A review of the literature.
- Defense of a computer crime case.
- Admissibility of evidence in a computer crime case.
- Contract provisions to increase security against computer crime.
- Lawyer/auditor relations in the prevention and prosecution of computer crime.
- Computer crime legislation: Present statutes and proposed alternatives.
- A lawyer's guide to the computing part of computer crime.
- Computer ethics and computer crime.

Becker, who will edit the issue, indicated that other computer crime topics will be considered.

Computer Law Journal is published monthly by the Center for Computer Law at 675 S. Westmoreland Ave., Los Angeles, Calif. 90005.

More information is available from Becker at the National Computer Crime Data Center, Suite 540, 320 W. Temple St., Los Angeles, Calif. 90012.

Office Systems Expo Set For Public-Sector Users

WASHINGTON, D.C. — Presentations by more than 150 exhibiting corporations as well as a number of symposiums conducted by the National Archives and Record Service (Nars) will highlight the third annual Federal Office Systems Expo (Fose) which will be held March 13-14, here.

Formerly known as the Federal Office Equipment Expo, Fose will cover such areas as word processing, micrographics, computerized filing systems, electronic mail equipment and information retrieval systems, a spokesman said.

Several equipment exhibits will be geared to the integrated systems concept, which offers product groups with interfacing capabilities.

The conference sessions will be broken into two segments. The first will explore the cost-effective use of modern technology in records management from the government's point of view; the second will offer seminars presented by recognized leaders from industry, education and trade publications and associations, the spokesman explained.

Panel discussions will be featured in most of the sessions, and audience participation will be invited following each panelist's comments.

The entire conference, including the Nars seminars, is free of charge to all interested professionals from the commercial sector as well as from federal, state, city and local governments, the spokesman said.

Advance registration is available from National Trade Productions, Inc., Suite 104, 9301 Annapolis Road, Lanham, Md. 20801.

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DPer Retires After 41 Years

(Continued from Page 17)

None at all. Wassell maintains that after the major conceptual differences between card sorters and tabulating equipment and the 1401 with a symbolic programming language, the switch to a higher level language was relatively minor. He will end his career as a Cobol programmer/analyst.

What It Takes

Between 1937 and 1979, Wassell has been a participating witness to the most rapidly advancing technology in the world. He successfully adapted to an environment where change is the watchword and flexibility is not only a desirable characteristic, but an indispensable one. What qualities or skills did he find most helpful in his career?

"Attention to detail and the ability to solve puzzles are absolutely essential. Because that's what programs are. Books always call them problems, but they're not. They're only puzzles," Wassell noted.

Wassell also had these words of advice for the entry-level programmer: "Learn the fundamentals. Get the basics. Because if you haven't got those, you haven't got gusto."

He was also able to shed some light on the etymology of the curious word that, at one time or another, every programmer is forced to utter. I refer, of course, to "bug."

According to Wassell, it happened way back in the days when computer engineers were called "repairmen." A problem had developed on a piece of hardware. It appeared that a relay was malfunctioning.

After locating the suspected relay by tracing the appropriate chart, the repairman uncovered the correct panel, took one look and uttered the immortal words, "There's a bug in your hardware." He then removed the corpse of one common housefly from the machinery.

Not only was the equipment repaired, but an idiomatic expression was added to the programmer's vocabulary.

To Implement Act

Fed Seeks Comments on Proposed EFT Rules

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Federal Reserve Board has requested public comments on a set of proposed regulations to implement the Electronic Fund Transfer (EFT) Act, a new law designed to protect consumers in the use of EFT services [CW, Oct. 23].

The proposed regulations address two sections of the act, scheduled to take effect Feb. 8. One section establishes limits on consumer liability for unauthorized transfers after the loss, theft or any unauthorized use of an EFT card or "other means of access," and the second establishes a "partial ban on the unsolicited issuance of EFT access devices," the "Fed" stated in its requests for comments.

According to the proposal, the consumer's liability for unauthorized transfers would be determined in the following ways:

- If the consumer notifies the EFT service provider within two business days of the loss of his EFT card, the consumer's liability would be limited to $50.
- If notification does not occur within two business days and the banking institution determines "that losses which occurred after the close of the two business days could have been prevented had the customer notified it," the consumer's overall liability could be as high as $500.
- If notification does not occur within 60 days after "transmittal of a periodic statement that reflects an unauthorized transfer," the consumer's liability may be unlimited.

The Fed noted its regulations would extend those time periods "in the presence of extenuating circumstances such as hospitalization or extended travel."

Addressing unsolicited issuance of EFT "access devices," which the act defines as "card, code or other means of access," the Fed proposed to permit such issuance if four conditions are satisfied:

"First, the unsolicited device cannot be validated" — that is, it cannot be used by the consumer until the subsequent conditions are met.

"Second, the issuer must include a written disclosure of the consumer's rights and liabilities that will apply if the device is validated.

"Third, the issuer must also disclose that the device is not validated and how a consumer not wishing validation can dispose of the device.

"Fourth, the access device may be validated only upon request of the consumer and after verification of the consumer's identity."

Noting the act calls for a "complete disclosure" of the consumer's rights and liabilities if the access device is validated, the proposed regulations would require the disclosure to outline:

- The consumer's liability for unauthorized transfers and how to notify the EFT provider of loss of the access device.
- The type of transfers available to the consumer, the charge for such transfers and any limits on the frequency or amount of the transfers.
- The circumstances under which a financial institution will disclose account information to third parties.

In addition, the Fed regulations would require the issuer to disclose whether the following "rights and procedures" are available to the consumer:

- The right and the procedure to stop payment of preauthorized transfers.
- The right to receive documentation of transfers.
- A summary of the issuer's error resolution procedures.
- The issuer's liability to the consumer for failure to make transfers.

The Fed has also prepared a preliminary statement, as required by the act, to demonstrate that "the consumer protections provided by the proposed regulations outweigh the compliance costs imposed upon consumers and financial institutions."

In addition, the request-for-comments document includes "model disclosure clauses" for use by EFT providers and definitions of terms used in the act, such as "account," "business day" and "access device."

Pointing out that the act permits the Fed to "modify the requirements of the act as they affect small financial institutions upon a determination that such modifications are necessary to alleviate any undue burden," the Fed also solicited comments on whether such modifications are necessary.

Further, comments are sought concerning the offering of EFT services by nonfinancial institutions and whether specific provisions should be made to ensure they are covered by the EFT act.

The Fed said comments must be received by Jan. 29 and should be sent to Secretary, Board of Governors of the Federal Reserve System, Washington, D.C. 20551.

Additional information regarding the proposed regulations can be obtained from Dolores S. Smith of the Fed's Division of Consumer Affairs. Information on the economic impact analysis can be obtained from Cynthia A. Glassman at the Fed's Division of Research and Statistics.

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Editorial

Obnoxious — And Dangerous

Data bases — whether computerized or not — often present a clear danger to our way of life. An example of that danger is illustrated by the actions of officials in St. Mary's Parish (county) in southern Louisiana [CW, Jan. 15].

A recent state law has empowered county officials to fingerprint and issue special identification cards to transient workers who come into the area seeking work. St. Mary's officials have taken that law one step further, requiring anyone who changes jobs to obtain the ID card and assuring that almost everyone in the county will eventually be registered, possibly in computerized data bases.

The idea behind the state law was to keep "undesirables" out of the area and make sure people wanted for crimes could be identified.

But the law is obnoxious — and St. Mary's implementation is even worse. It treats the innocent like the guilty and will certainly hurt innocent people more than guilty ones.

The idea of internal identification cards smacks more of the racist government of South Africa or the regime of Adolf Hitler than it does of the U.S. The American Civil Liberties Union is fighting against the use of such cards. Hopefully the federal courts will quickly reject their use.

FYI: Duplicate Mail

Perhaps you of the editorial staff should take a closer look at your own operations prior to extolling the virtues of "humanistic data processing systems." In my mail today there were three identical letters offering new subscriptions to Computer Business News *and another letter offering a new subscription to* Computerworld *. . . The problem is I already subscribe to both publications. Please teach your computers to remove a subscriber's name from the prospect list.*

Dale W. Saville

Subscriber Saville's recent letter made a good point, but unfortunately there is little we can do about the situation.

Both *Computerworld* and *Computer Business News* are currently promoting subscriptions through the mail, and readers may receive more than one offer to subscribe.

We could perform a "duplicate elimination" — or "dupe elim," as it is known in circulation promotion circles — to remove duplicate names from our lists, but only if we have access to the names. Unfortunately, this is not the case with most mailings.

When we purchase a list of names of people active in the computer field from any number of sources, we do not get the names in machine-readable form. Actually, we don't even get our hands on the names themselves.

Here's what usually happens: When we purchase a list of names, the seller of the list reviews the literature we plan to send to the people on that list. Both our literature and the list of names and addresses are then sent to a third party, a mailing house where the names are placed on the envelopes.

Because many of our readers are active in several organizations that sell their lists, they end up receiving duplicate offers to subscribe.

If we were allowed to get the lists in magnetic form, we would gladly perform dupe elims on the lists. After all, we don't want the extra expense of mailing more than one envelope to one individual.

Meanwhile, please pass on those subscription offers to others who might be interested.

Data Past

Five Years Ago
Jan. 23, 1974

MONTREAL — McGill University was sued for allegedly using a patented software program without paying royalties. According to Xoma Ltd., the plaintiff, the suit was a warning to U.S. and Canadian users that more suits were on the way. Xoma thus began a campaign to ensure that "reasonable royalties" would be paid for the use of an accounting system on which it had received a Canadian patent and to cut off any infringement on its rights to the patent.

— — —

TULSA, Okla. — In its antitrust case against IBM, Telex requested a contempt citation against IBM for failure to supply interface information, but it was dismissed by U.S. District Court Judge A. Sherman Christensen. Christensen ruled IBM had not violated orders handed down the previous November and upheld IBM's claim that the information requested by Telex concerned computer design rather than interfaces.

Eight Years Ago
Jan. 27, 1971

PARK RIDGE, Ill. — Of the 1,100 candidates who took the first annual Registered Business Programmer Examination, sponsored by the Data Processing Management Association (DPMA), 434 candidates — 39.5% — passed. The test was administered at various locations in the U.S. and Canada.

Letters to the Editor

Two Little Problems

I am pleased Werner Frank has found the work of E.C. Lamb and myself helpful. However, there are two problems with his references to it in Part 1 of "The New Software Economics" [CW, Jan. 8].

Figure 4 showed comparisons of machine operating costs with development and maintenance costs. Unfortunately, the development cost column omitted 000s that should be there.

The comparisons should show, for example, $41,000 in machine costs to run programs which cost $7,992,000 to develop and maintain. The ratios shown are correct as rounded off.

The second — perhaps minor — point is that 50% of all application programs absorbed less than 2% of the machine capacity devoted to that category of programs, not the total capacity. Conversely, 2% of the programs absorb 50% of that same category.

If we include all operations, then we find that half the application programs use less than 1% of the total capacity, and the top 2% of all programs use only about 20% of the total capacity.

These are minor points and serve only to strengthen and reinforce the point that "ongoing software performance improvement, when it is an issue, can be relegated to a very small and identifiable set of applications."

Robert C. Kendall
Information Systems Adviser
IBM
White Plains, N.Y.

At Cross-Purposes

Part 1 of "The New Software Economics" was informative and insightful [CW, Jan. 8]. However, it failed to address a dilemma that more and more of us will be facing, namely that proprietary software and the data base concept are presently at cross-purposes.

My company purchases software whenever possible because of the many benefits described by Frank, and we are also adopting data base technology and its philosophy.

The essence of data base philosophy is "shared data." This provides many benefits, such as the potential to minimize redundant data, standardized restart and recovery and, most importantly, the improved potential to provide management with ad hoc reporting capability.

If we buy proprietary software, we lose these potential benefits. Proprietary systems are often inscrutable.

Furthermore, most software vendors don't want to disclose their systems' internals because of the fear of getting ripped off.

Admittedly, some proprietary systems have a data base option, but all the ones I've studied merely put the data in the data base in the same format that's used in their conventional files.

Little — if any — attempt is made to restructure the data and, of course, field sizes and formats are never entirely compatible with other packages. For instance, name and address data is different in each system.

Someday, perhaps, there will be data format and structure standards. However, based on what's presently available, I think the DP community is stuck with a tough, tough dilemma.

I'd like to stimulate some concern in this area with the idea of developing some universal data standards.

I realize how illusory this could be, but is there any other choice?

J. Paul Bigley
Sacramento, Calif.

The Human Connection

How Do 'DP Troops' Perceive DP Manager?

By Jack Stone
Special to CW

As part of a seminar I teach in systems marketing in the management information systems (MIS) environment, there is a section given to subjective factors, an area important to understanding how to deal with the MIS function from the outside, looking in. These factors include human relationships, attitudes and perceptions among MIS, user, management and vendor organizations.

During one recent class, a student threw me a curve ball question. He asked, "How would you describe the perceptions of the DP manager by the DP troops? What do they seek in the way of leadership?"

My first reflection was on my own troubled experience as a DP manager. I recalled that I was always so busy trying to keep the department afloat that I never really gave a thought to how my people viewed me.

But before I thought further, a second, very articulate student rescued me by offering her own ideas on the subject. She was formerly a programmer with a major university and supported a large-scale installation.

"During my tenure — a period of years — I had three DP managers whose skills, attitudes and operating philosophies were widely different," she began. "I labeled them the 'scholar,' the 'professional' and the 'salesman.' Let me describe how we related to them in sequence."

Scholar's Withdrawal

"The background of the first, the 'scholar,' was that of a user. He had concentrated on teaching and research in his chosen field of study. As most scholars do, he viewed the computer solely as a tool and had no particular interest in the technology.

"Since he had no background in analysis or programming, he had no real appreciation of the systems development process or of machine operations.

"As a result, he developed a withdrawn, even defensive posture with respect to the staff. He pulled in his horns and became a very private person. He established an inverted, 'closed-door' employee relations policy and choked off internal communications.

"He evoked a siege mentality, which was reinforced by the physical layout of the office area. His office was located at the center of concentric circles of desks and offices. His high-level managers occupied the inner circle, and the lowest ranking technicians were in the outer one.

"Only these technicians handled user contacts. The programmers dealt almost exclusively with their supervisors and rarely saw the DP manager or user decision-makers.

"But, curiously, the users were not complaining, in spite of the lack of proper service. We believed the explanation lay in the politics of the situation. The 'scholar' held his union card — the Ph.D. — and had his publication credits behind him.

"We programmers were terribly isolated and had inadequate guidance and leadership. For example, a team of us worked for several months developing a comparative analysis of certain software systems for the DP manager. He never even acknowledged receipt of the report.

Professional's Undoing

"Possibly it was because of our complaints that the 'scholar' was eventually replaced by the 'professional.'

"Now the 'professional' was one of us. He came up the DP ladder, having performed the roles of programmer and analyst. Overnight, the closed door swung wide open.

"The communications were great! He participated in the structuring of development projects, helped us obtain needed resources and set priorities. He was a good manager, an excellent leader and an effective listener. He worked very well with the DP staff, and we loved him.

"But, unfortunately, university politics proved his undoing. He suffered image problems with the academics because he didn't have the credentials."

"In short order, the 'professional' was excommunicated from the university professorial society and replaced by the 'salesman.'

"No. 3 was literally a salesman, having had experience as a marketing manager for a mainframer. He was selected because the university administration obviously felt the problem with the computer center was a marketing one.

"This manager was energetic and dynamic. He communicated easily with everyone and was always enthusiastic. His charisma helped win over the academic types.

"He won them over also because he promised the world to the users.

"Sure, he knew his hardware and software, but he was totally ignorant of the systems development process and what it takes to get a system up and running. In his sales zeal, he continually oversold our capabilities, committing us to projects which were impossible to complete within the time and with the manpower that were allocated.

"I finally left because his commitments nearly drove me crazy.

"Based on my experience, I believe DP centers need two full-time managers, a salesperson-type to handle external matters with users and top management and a 'professional' to administer internal operations and keep the 'salesperson' honest!"

And in This Corner . . .

United California Bank Blames Jam on Computer

By Kenniston W. Lord
Special to CW

"Well, here's another nice mess it's gotten us into!" the brochure began. It continued, "Our computer did it again, folks. Fouled up. Really fouled up." So goes the brochure from the United California Bank (UCB).

The rest of it is quoted for your edification, since you have a right to see the kind of garbage being generated by one class of computer user — the bank.

"What happened was . . . For some unexplained reason, our computer took it upon itself to print a little message on most September statements. A lot of our bank card customers were told (to their surprise) that their available credit line had been increased, whether they wanted it or not.

"Allow us to explain . . . Computers are only human. At least, ours seems to think it is. That message should never have been on all statements. How it got there, only the computer knows. And it's not going to tell us who pushed the button that caused the problem. How's that for loyalty?

"The truth is . . . If you're not sure how much credit you have, simply look at the top right-hand corner of your next statement. You'll see a headline that says 'Credit status.' Just below that is a box that reads 'Your credit limit is...' The figure that appears there is your credit limit.

"We're sorry for any confusion our computer may have caused you. It won't happen again. Or so our computer promised."

I fairly "flipped" when I read the brochure. Longtime readers of this column are aware that some input from the UCB caused me to take some action in the licensing arena four years ago.

Insults Intelligence

Jim Mosteller, who sent me this "gem," made the case very clearly: "The consistency with which banks disregard their customers' interests is nicely matched by the insults to intelligence they distribute to 'explain' their DP-related foul-ups."

He went on to say that the UCB's management must think its customers either don't know human error must be responsible and won't mind believing a machine is pursuing uncontrollable

(Continued on Page 22)

The Taylor Report

NCR Exec's Letter Shows No Yielding on Contract

By Alan Taylor
Special to CW

In court, a vague DP contract can work in favor of the user who signed it. This is because there is a considerable body of law that says vague terms should be interpreted *against* the interests of the person who wrote them.

Disputes about the meaning of NCR Corp.'s Universal Agreement are kept out of the courts, and the results are kept in unpublished arbitration records. Therefore, no one really knows *how* the vague terms have been interpreted.

The NCR user who becomes involved in a dispute about the meaning of the contract usually gets "the short end of the stick," and this column is often addressed to such situations.

One user asked NCR to add a written explanation — in the contract — of some undefined terms in the document before he signed it. The request wasn't handled locally; it went to no less than NCR's W. F. Walsh, vice-president of financial system marketing.

Walsh is one of the few people specifically authorized to sign universal agreement contracts on behalf of NCR. Though the following is an internal memo, it was sent to the user as the expression of NCR official policy.

"The amendment proposed by the customer is unacceptable as written," Walsh said. "We do not agree that the Universal Agreement should be used to define specific words used in the Universal Agreement. Definitions of terms exist in other NCR documents."

NCR has so far made no claim that these "other" documents were given to the user to study before the contract was signed. The company has been asked to clear up this question.

Another Question

Another question the user had concerned Section 4 of the Universal Agreement. That section begins as follows: "*Purchase Price* — NCR shall invoice the customer for the purchase price balance or if applicable the first installment of it upon certification or delivery of the equipment by NCR. . ."

Now, there's a problem, here. The customer is held liable for payment if the equipment is cer-

(Continued on Page 23)

Bank Brochure Insults Customers' Intellect

(Continued from Page 21)

courses while it minds their money, or will enjoy the 'cute' parody of a situation in which insufficiently tested software was used to prepare its statements." That rather sums up the situation from the ethical DPer's viewpoint.

I wonder, however, just what it says about irresponsibility. Read the text of that brochure again — slowly. Just what *has* the UCB admitted?

Bank's Admissions

- That it does not audit its material produced on a computer.
- That it is willing to send an incorrect product to the customer.
- That it is not willing to accept directly the responsibility for its actions.
- That it is unwilling to provide corrective action until the "next" statement.
- That it has done this more than once ("*another* nice mess").

These are the things to which the UCB has admitted. Undetailed, but ever present, is the admission that UCB doesn't even know whose statements were incorrect.

But for UCB to blame the whole mess on the computer is unconscionable: "our computer took it upon itself . . . Computers are only human . . . How it got there, only the computer knows . . . It's not going to tell us who pushed the button . . . confusion our computer may have caused you."

Sure, UCB had a problem. It may have been in data entry. It may have been a poor test. It may have even been a disgruntled employee. But would it have hurt to tell the truth?

Any Justification?

Mosteller said, "Perhaps the bank would try to justify it as 'all in good fun,' but there is more than enough personification of DP and its troubles to be found these days." He wondered, in his letter, if UCB's DP group saw the brochure before the public relations group sent it out — or worse, wondered if they helped to write it.

There is no doubt no law designed to stem the tide of irresponsibility, as evidenced by UCB's brochure and the actions of the thousands of self-aggrandizing financial institutions which dot the land.

But misrepresentation is entirely another matter. One wonders about such misrepresentations; has the bank really made such a misrepresentation? And if it has, who has been hurt by it?

Has only our sense of professionalism been offended? Has our empathy for the consumer been activated? The brochure is an exercise in polished absurdity, but would an organized protest against such actions be equally absurd? Do we tilt at windmills?

Callous Disregard

It seems obvious to this writer that UCB has, at the very least, callous disregard for its customers. It has proven that it is more than willing to insult its customers in print. Its just deserts would be to have those customers withdraw their funds en masse.

But it won't happen, primarily because most customers won't even understand the manner in which UCB has acted; if you'll pardon the pun, UCB is "banking" on that.

It felt obligated to provide the standard nondiscrimination notice but not to tell the truth. I wonder. Are customers to be treated merely as sheep? Is the bank to be allowed to comport itself in this manner?

The answer to both questions is probably "Yes." Sadly so.

Not Amusing

These actions aren't new. They've been going on for years. There's probably no plan of conscious action for such misinformation. It's just that banks have gotten away with it. Unless you, when you get such rubbish, make it known — by your words and by the withdrawal of your funds — the situation will never change.

Did Mosteller withdraw his accounts? I don't know. I hope that if he was as annoyed as he indicated, he did. UCB did get a copy of his letter.

No Excuse

Jim's final comment to me was, "I am not amused." And frankly, neither am I. Neither are Laurel and Hardy.

But amusement is not the issue, is it? What then *is* the issue? Let's put it this way: What is the right of a bank — or any institution, for that matter — to use the computer as an excuse for insensitivity, for misinforming customers, for the arrogant disregard for the human intellect as depicted in the UCB brochure? And another question: What are we going to do about it?

Next time we'll share the story of how one person was charged for fuel and food purchases made on his credit card, while he and the credit card were a thousand miles away and how the bank insisted that the computer — and not the customer — was right.

Still later, we'll detail some simple steps for dealing with these institutions; it will be an incomplete list, to be sure, but a beginning.

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Some Corrections On BASF Disk Drive

BASF Systems, Inc. has begun U.S. production of a 5.25-in. floppy disk drive in Bedford, Mass., as reported in "Extra-Density Minifloppy Drive Built for Desktop, Portable Units" [CW, Jan. 8]. Contrary to information in the article, however, the Model 6106 is now available in production quantities rather than just in sample quantities.

The drive is 33⅓ smaller than the industry standard, and we would like to point out that the 33⅓ figure in the article should have related to the compactness of the drive, rather than to its greater storage capacity.

The Model 6106 does make possible about 15⅓ more storage capacity than the SA-400 because of its 40-track capacity vs. the Shugart Associates, Inc. drive with 35-track capacity.

In addition, it was incorrectly stated that a Shugart-sized front plate is available as a standard feature. The plate is offered as an option.

John J.Healion
Vice-President, Computer and Business Products
BASF Systems, Inc.
Bedford, Mass.

Letters to the Editor

Getting in Touch

I read the editorial, "The Untapped Resource" [CW, Nov. 27] and the article "Lack of Women DPers Seen 'Severe Loss'" [CW, Nov. 20], and I commend your efforts in reporting the shortsightedness of most companies in the DP field which fail to utilize this powerful human resource.

It was reassuring to know that others share this perspective.

Please tell me how I can get in touch with Joan Callanan, manager of the National Science Foundation (NSF) Women in Science Program.

Carolyn Yee
San Francisco, Calif.

Callanan can be reached in care of the NSF, 1800 G St., Washington, D.C. 20550. Ed.

Interpretation Matter

"User Endures Eight-Month Switch to DDP" [CW, Nov. 27] referenced a workshop I presented at the International Data Corp. conference on distributed DP in New Orleans.

A statement was made that Digital Equipment Corp. refused to maintain terminals at E.R. Squibb & Sons, Inc. remote sites. This was completely inaccurate.

Actually, the situation was that DEC had no previous policy of providing Decservice. DEC's critical service coverage, to an installation without a CPU. It never refused basic service to Squibb's distribution center.

Through negotiation, Squibb now has the level of service it needs and DEC was flexible enough to provide for it.

I thought it important to correct this misinterpretation of what was said since DEC's field service organization has been especially cooperative and responsive to Squibb.

Joanne Finch
Manager
Minicomputer Services Department
E.R. Squibb & Sons, Inc.
East Brunswick, N.J.

Exec Rejects User's Ideas

(Continued from Page 21)

tified or delivered. But the customer needs the equipment to be both certified and delivered before he can get any use out of it.

The careful user who wrote to NCR objected to the use of the word "or." Walsh responded: "The deletion of the words 'or delivery' is not necessary. NCR would not expect payment on delivery if the equipment required set up, training and so forth. Thus, NCR and the customer would certify acceptance; the customer would sign a billing authorization; and then an invoice would be rendered."

A new trap can be sprung when NCR defines terms in other NCR documents. This is shown even in Walsh's rejection of the user's request. It is contained in the phase "NCR and the customer would certify acceptance. . ."

Now, there is nothing about a customer having to certify acceptance anywhere in the Universal Agreement. In fact, a quick reading seems to indicate that NCR is the only party certifying anything — although *what* is being certified is omitted.

According to Walsh's written comment, however, Section 4 does not limit certification to NCR. The word "certification" in the contract needs further clarification. Is this certification done jointly by NCR and the customer or just by NCR?

NCR is simply repeating the old "Alice in Wonderland" argument that "a word means what I want it to mean." It is hiding behind a deliberate lack of definition in the Universal Agreement to make words mean what it wants them to mean in secret arbitration proceedings.

Often, the user's lawyer realizes too late in these arbitration proceedings that his ammunition was inadequate in the face of NCR's strategically placed artillery. None of this means the NCR tactics are praiseworthy, proper or even legal. They're just dangerous.

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A Cullinane Project

DBMS Altered to Support Shared Data

By Don Leavitt
CW Staff

WELLESLEY, Mass. — Cullinane Corp. has designed and already built much of the software needed to allow multiple IBM 370 or compatible CPUs, each operating in a data base environment, to share data stored on direct access storage devices (Dasd).

That's a rather common capability for installations running under a conventional operating system, Cullinane Vice-President Robert Goldman admitted in a recent interview. But it is unusual — indeed, it has never been done before — with processors running under data base management systems (DBMS), he pointed out.

"Conventional" shared Dasd operations take advantage of facilities built into the operating systems to prevent concurrent updating of data. Some of the techniques used are rather crude.

The RESERVE DEVICE clause, for example, prevents secondary users from accessing any data on a device until the first user's update, probably on just one or very few fields, is completed.

That sort of lockout would be intolerable in a DBMS situation, yet until now users had no other means to prevent concurrent updating of data on Dasd shared by two or more CPUs working in the high-level data base-oriented environment.

The problem, in Goldman's view, was that each DBMS involved in a multiple computer site was equal to all others in its control of resources. The solution to the problem entailed setting up a "pecking order" or, more specifically, making one DBMS the control vehicle for all.

Control Problems

Under Cullinane's Multiple Computer Support (MCS) concept, only one DBMS actually has access to the Dasd data. All other DBMS have their accesses filtered through the "master" DBMS, having reached it through a channel-to-channel adapter between the processors.

While that resolves the conflicts or the compromised data that might result from multiple DBMS attempting to access the same data, it poses a whole range of control problems on the DBMS, Goldman noted.

The controlling DBMS has to be able to keep track of what requests it is handling, where they came from and what data they involve. The subordinate DBMS have to keep track of what requests they have passed along to the "master" and what responses they have gotten back.

To cope with such problems, Cullinane utilizes the "central" version of its IDMS data base software, which was developed to allow multiple users on a single CPU to work with the same copy of the DBMS. But Goldman and his technicians have added several features to the existing central version.

To interface with each program, Cullinane envisioned and implemented External Run Units (ERU) which track each request, time-stamping them and indica-

(Continued on Page 26)

'Dynam/FI' Redefines User Files

NEW YORK — IBM DOS/VS users can redefine the physical attributes of any sequential file at execution time without making any changes in the original program through the use of the CA-Dynam/FI package, according to the vendor, Computer Associates, Inc.

The file independence is activated by additions to the program's JCL or through its catalog, a spokesman explained. The flexibility provided should improve programmer productivity, increase job throughput and improve management of peripheral resources, he added.

With CA-Dynam/FI, existing block sizes on disk or tape files can be changed according to specifications in the JCL. The user may also specify that the block size be optimized according to device type, the spokesman said, noting that single or double buffering is allocated dynamically to the defined file.

A tape file, sequential disk or Vsam file can be simulated by a unit record device through CA-Dynam/FI, the spokesman continued.

The package can allocate records to or retrieve records from a Vsam file even when a non-Vsam file is defined in the user program. In addition, at the user's option, CA-Dynam/FI can release an assignment of a logical unit when the file is closed, freeing the assigned drive for other work, he said.

The spokesman also noted that CA-Dynam/FI has its own catalog, which allows the user to specify a variety of file attributes without having to modify JCL. The user may also set default sizes for DOS/VS Exec statements that have no size operand, he added.

For control purposes, the package provides, as an installation option, an audit trail data set to be created and maintained to track processing performed by CA-Dynam/FI on any given file. A report generator module supports user-defined printouts related to CA-Dynam/FI processing.

The CA-Dynam/FI package costs $2,500, but is also available under several lease plans, Computer Associates said from 655 Madison Ave., New York, N.Y. 10021.

CICS Program Development Eased

NORWALK, Conn. — An on-line program development tool for users of IBM's Customer Information Control System (CICS) and CICS/VS dramatically curtails programming expense, gets better user involvement in new work and produces better systems than are possible without the support, the vendor of the package, Turnkey Systems, Inc. (TSI), claimed.

The CICS/MM package relieves the programmer of all message mapping and data editing functions, thus reducing the user-coded on-line program to application logic alone, a TSI spokesman said. In addition, CRT formats for both input and output can be created interactively by nonprogrammers.

As a result of the CRT design support, end users without any DP experience can participate in the design of their interface to an on-line system before programming begins. That in itself should ensure the programmer's work has a solid basis, the spokesman continued.

Editing Rules

Data editing rules, including complex arithmetic operations and table lookups, are specified on-line as the formats are created, and the coding to apply the rules is built into preprocessor runs that screen the data before it goes to the application program. That way, the data is "clean" when the user program gets it and, because the edit work is eliminated at that stage, the program should run faster, the spokesman said.

To further reduce the programming effort, CICS/MM produces a printed description of all new data formats and the corresponding source books which become input to PL/I, Cobol or assembler-coded application programs, TSI noted.

The more compact programs made possible by CICS/MM should more than offset the 36K bytes it requires for its reentrant nucleus, the spokesman said, noting that the smaller programs also lead to faster responses and lower CPU utilization.

CICS/MM, which can be purchased for $14,000 or leased for $390/mo, will support any release of CICS or CICS/VS, TSI said from 111 East Ave., Norwalk, Conn. 06851.

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Management Course Offered

PALO ALTO, Calif. — The Institute for Software Engineering is offering, at various locations around the country, a four-day course to assist DP managers and senior technicians in implementing a capacity management function within their organizations.

Capacity management is the general process of providing the required computing capacity at the lowest unit cost commensurate with service, reliability and similar constraints, an institute spokesman explained.

Nontechnical in nature, the course is said to provide an insight into all aspects of the subject. Various organizational models are discussed, for example, and an optimum model is selected. Capacity management is then divided into its major subsystems and organizational charters are developed for each.

Critical functions of capacity management — including statistical treatment of performance data; capacity and performance reporting; forecasting and instrumentation; and organizational feedback mechanisms — are discussed in great detail, the spokesman noted.

The cost of the course is $375 for institute members and $625 for nonmembers. More information, including dates and places the course will be presented, is available through P.O. Box 637, Palo Alto, Calif. 94302.

CRT Screens, Commands Enhanced in 'UCC Seven'

DALLAS — The UCC Seven automated production control system from University Computing Co. (UCC) has been enhanced to make management of IBM OS-based installations easier than before, according to the vendor.

The software is in a growing class of packages designed for on-line control of the many elements involved in managing work flow through a large-scale DP center. Also in this class are Dimension V from Software Systems, Inc., Panexec from Pansophic Systems, Inc. and Apex from Johnson Systems, Inc.

Release 2.1 of UCC Seven incorporates CRT screen formats that carry more information than in previous releases. It also offers several system commands to provide better communications between work areas, a spokesman said.

A "broadcast" feature, for example, sends messages to all terminals in the user's UCC Seven network. While the base command puts the messages in the normal queue of work to be displayed, an EXPRESS BROADCAST command triggers an immediate interruption.

"Extensive use" of the Programmed Function (PF) keys of IBM's 3270 Model II terminal is another feature of the UCC Seven update. PF key assignments can be made on-line and transactions can be defined to each key, the spokesman said.

Remote job entry (RJE) support for JES2 is now a UCC Seven facility, allowing direct access from the remote site to the control software and improving the RJE site's ability to control its workload, the spokesman continued.

The package is available for $32,500 or on a 36-month payout plan, UCC said from 8303 Elmbrook, P.O. Box 47911, Dallas, Texas 75247.

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DBMS Adapted To Share Data

(Continued from Page 25)

ting return codes and other pertinent information. To manage the changing mix of ERUs, Goldman and the staff also built a Data Base Resource Controller module.

'Packet' of Information

To free the data information from the program, Cullinane reached into the concepts — and jargon — of telecommunications, creating a "packet" of information within each program as it makes a data base request. This packet identifies the data sought and the requesting program and is transferred to the DBMS as a request is made.

Thus the DBMS has internally all the data it needs to get the results back to the right program.

The DBMS in each processor in the multiple computer hookup will maintain ERUs and packets of its own work, although it will not act on this material except to pass it to the master DBMS and monitor the returning data until it reaches its final destination.

Goldman said Cullinane already has most of the software in its current central versions, especially the one developed for us in IBM's Virtual Machine (VM/370) environment with CMS, which closely approximates the real multiple computer situation.

The logic to go at either end of the channel-to-channel adapter is still under development, but it should be ready for beta testing at a user site sometime this spring, he said.

Since the MCS project has developed into a pattern of one machine serving as the fundamental data base manager for the entire complex of machines requiring the resources, Goldman acknowledged that it is similar in some respects to the "data base machine" or back-end processor Cullinane built last year, in which a Digital Equipment Corp. PDP-8 handled all the data base work for an IBM 370.

Advertisement

DP Dialogue

Notes and observations from the IBM Data Processing Division that may prove of interest to DP professionals

On this Hollywood set, the TV series Bonanza was filmed. Paramount uses an IBM 3741 Data Station at the studio as a powerful cost-control aid. When a production unit goes to a remote location, it takes along a similar 3741.

Lights. Camera. Action. Data!

Along with cameras, lights, props and costumes, a production unit from Paramount Pictures Corporation takes along a computer terminal when it goes on location to film a movie.

The purpose, says Thomas Pavone, director of data processing/West Coast, is to enable an auditor to monitor expenses against the budget on a daily basis.

At Paramount, a subsidiary of Gulf & Western Industries, a production unit is like an individual company with an auditor who makes all disbursements, Pavone explains. As each expense is incurred – hiring of carpenters, rentals of space and equipment, purchases of supplies and material – a clerk enters the details at the terminal. And as actors, technicians and other employees turn in time cards, the hours they have worked are also keyed into the IBM 3741 Data Station.

The terminal incorporates a small processor that operates as a "standalone" computer during the day, keeping a continuous account of production costs and accumulated hours worked by the crew. A payroll program in the 3741 calculates the gross pay for each employee, allowing local artisans and free-lance employees to be paid immediately. At night, the data is transmitted over the leased telephone line to a terminal in Paramount's Hollywood studios, and relayed to the company's IBM System/370 Model 148 computer in New York City, where the regular payroll checks are prepared.

Up to the Day

"The auditor now knows exactly how much money a production has spent – up to the day," Pavone points out, "and management knows it just as quickly. With a clearer picture of what has been paid to date, the auditor can do a much better job of projecting an estimated cost to finish."

Laser Tailors Men's Suits for Richman Brothers

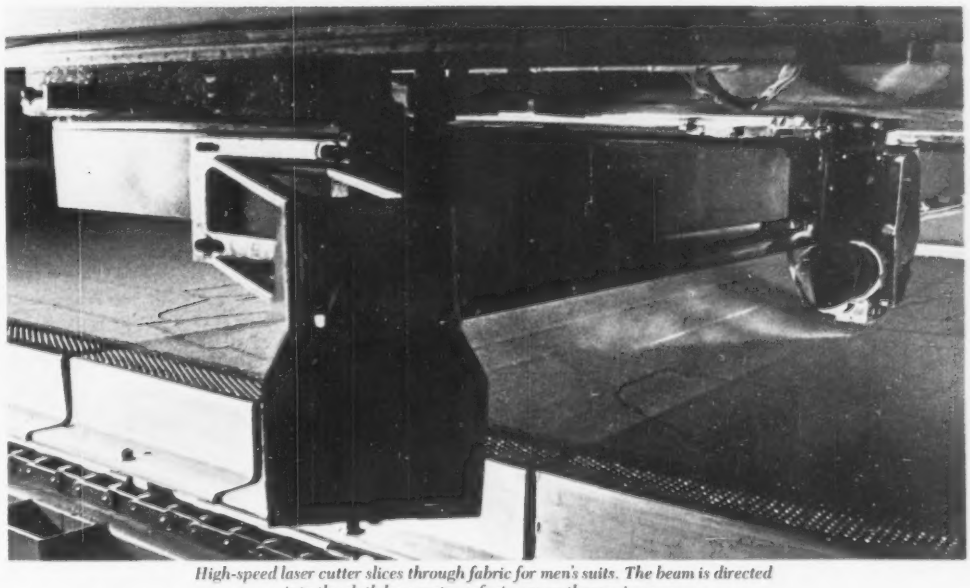
Responding to information recorded on a magnetic tape by a computer, the mechanical arm flies over the surface of the cloth at velocities that reach 36 inches per second. The blue-white light from its end makes a fine, surgically clean cut as it moves. The beam, from a laser, is directed into the cloth by a mirror system attached to the moving arm. The cloth is destined to become a man's suit.

J. O. Burton is manager of Manufacturing Research and Development for Richman Brothers, a major men's clothing manufacturer and retailer headquartered in Cleveland. "Through the use of the computer and a laser cutter, we are saving 10 to 15 percent of cloth, which was formerly wasted by manual planning and cutting techniques," Burton says. "In addition, we receive consistent accuracy on all cut parts, which in the end means we produce a better tailored garment for our customer."

Computer Controls Cutting

Use of the IBM System/370 Model 158 in manufacturing begins when cloth is delivered to Richman Brothers. It is first run through processing machines on which sensors – aided by an observer at an online terminal – note any blemishes or flaws. Other sensors report the position of each flaw. This information will be stored in the computer to provide instructions for automatic cutting around these damaged areas.

Another integral step in the manufacturing process occurs when the computer "grades" the designer pattern, usually a size 40 regular, to produce patterns for the full range of sizes. Working from the master pattern, which has been entered into the computer through a digitizer, each component is scaled up and down the entire size range. This is not a simple process, Burton points out; different elements of the pattern expand and contract in different, complex ways from size to size.



High-speed laser cutter slices through fabric for men's suits. The beam is directed into the cloth by a system of mirrors on the moving arm.

These components are then displayed on an IBM graphic terminal where an operator using a light pen makes the final placement of components in the cutting pattern in order to obtain maximum utilization of the material to be cut. This is the final step that provides the information for the laser cutter.

"We are working our way toward a total system concept," he continues, "using the data base to keep track of fabric, patterns, orders, and the progress of work through the plant. Very shortly the computer will automate the matching of patterns so that plaids and stripes will extend evenly across garment seams.

"These jobs, which were formerly done manually, required countless years of experience and skill. As our knowledgeable people retire, these skills are being lost. Fortunately, with the aid of the computer we will continue to turn out finely tailored suits and be able to reduce our manufacturing costs in the process."

DP Dialogue is designed to provide you with useful information about data processing applications, concepts and techniques. For more information about IBM products or services, contact your local IBM branch office, or write Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

IBM DATA PROCESSING DIVISION

Organization Change Seen Major DBMS Factor

By Stephen L. Robinson
Special to CW

Years ago, cars were mechanically rather simple. Driving through any neighborhood on a weekend, you could see dozens of hoods up as those fortunate enough to afford an old wreck put it in running order.

True, the cars of yesteryear were not very user-oriented. Air conditioning was a rarity; power steering and power brakes were mainly for "older folks," as were automatic shifts; automatic chokes were pretty much unknown as, of course, were microcomputers to adjust the fuel flow, idiot lights to indicate when anything was amiss with the electrical systems and bucket seats with 287 positions (none of them comfortable).

In this wonderful era of "user-oriented" cars, a curious problem has arisen. Fewer and fewer neighborhood kids can work on the new cars.

Have you looked under your hood lately? It seems difficult to even locate the engine, let alone identify its component parts.

Most people, I'm sure, are in the same sad position I found myself in last week. It was time for one of our twice yearly inspections. Our car, a nice simple Ford, was clearly in need of a tune-up. Although I am definitely not a modern car mechanic, I do drive the car and can hear, feel and sense that it needs a tune-up. What recourse do I have when the local dealer/inspection station mechanic says, "Oh, that always happens with older 302 engines"?

Data Base Corner

Or, to put things in a DP context (you knew I'd get around to it eventually), what does a first-time computer user do when the friendly vendor says there is a break-in period for automated order entry systems?

The user has been managing such a function for 20 years. He "knows" something is wrong. Errors are being made, reorder points are being missed and customers are screaming. What is the poor user to do?

If he is sufficiently outraged, he opts for legal action or contacts the media. Pick up a recent *Computerworld, Datamation, Computer Decisions* or *Infosystems;* there are dozens of articles about first-time (and even some long-time) users who have been severely burned by the evil Mr. Computer.

The accelerated presence of minicomputers and microcomputers has, of course, compounded the problem. People are snatching up turnkey systems, only to discover that they are not as turnkey as they expected.

Worse, the automated system may be so alien to them that they don't know how to extricate themselves from the mess they're in. They know how to "fix" the old manual system, but not the new automated system.

Relevance to Data Base

What has all this to do with data base? Unfortunately, quite a bit. The data base package vendors are all presently developing excellent user-oriented facilities. English-like query languages, report writers, and compiler interfaces are dramatically enhancing the potential value of the data base packages.

Notice that I said *potential* value. Poorly conceived data base systems, easily and rapidly implemented via the new user-oriented facilities, are already wreaking havoc in many shops. Data redundancy is actually increasing in many shops as end users create their own files for access by their new-found query facilities.

The error potential for information extracted from such redundant files is truly staggering. Data that is copied and recopied, and not subject to unified maintenance, is likely to yield erroneous information; the fact that the query facilities make the erroneous information very accessible doesn't help matters any.

Solution With User

The problem, of course, does not lie with the software vendors, but with the end users. The solution lies with the establishment of effective offices of data administration to control the proliferation of data files.

Organizations must recognize that a data base system represents a philosophy for organizing data and is not just a collection of software. The use of such software with unintegrated data files does not constitute a data base system; rather, it is simply an abuse of the software.

Mini and micro vendors and an occasional software vendor would like you to believe that the era of user-oriented idiot-proof systems is here. Don't believe them.

Read your literature, call up some of the principals in the stories, find out where they went wrong and don't expect the technicians to carry the ball alone.

The major problems in data base systems — and turnkey systems — are not technical; they are organizational, diplomatic and system problems. If you don't have a data administrator, get one.

An average data administrator will cause you to wonder how you survived without one; a really good data administrator is headed for the board room.

Robinson is an independent consultant operating as S.L. Robinson & Associates, Morrisville, Pa.

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'Forth' Drives Retrievals

CEDAR RAPIDS, Iowa — Source Data Systems, Inc. has developed an information management and retrieval system specifically for minicomputers and microcompouters. The system is built around the Forth operating system — from Forth, Inc. — which is operational on Data General Corp., Digital Equipment Corp. and General Automation, Inc. minis.

The package is said to support file management, data and screen definition, data management, file search, inquiry and report generation and to be designed for use by non technical personnel. It operates with 16K words of core, according to a spokesman.

Users are provided with the means of defining record formats and edit specifications that include the typical data entry requirements as well as more sophisticated validations such as effective date ranges, check digit calculations and matching fields against master files.

Fields can be updated or accessed in any sequence regardless of their order in the target record. They are immediately checked against designated edits.

Free-form searches for single or multiple fields that are equal to, less than or greater than user-specified values may be used to extrat data for screen displays or for reports.

The software package, including Forth, costs $25,000, Source Data Systems said from 208 Second Ave. S.E., Cedar Rapids, Iowa 52406.

Correction

The address of The Systems Guild, Inc. — vendor of the EDX Commercial Applications Subroutine Library 1 for the IBM Series/1 [CW, Dec. 25-Jan. 1] — is 103 Westlake Drive, Thornwood, N.Y. 10594.

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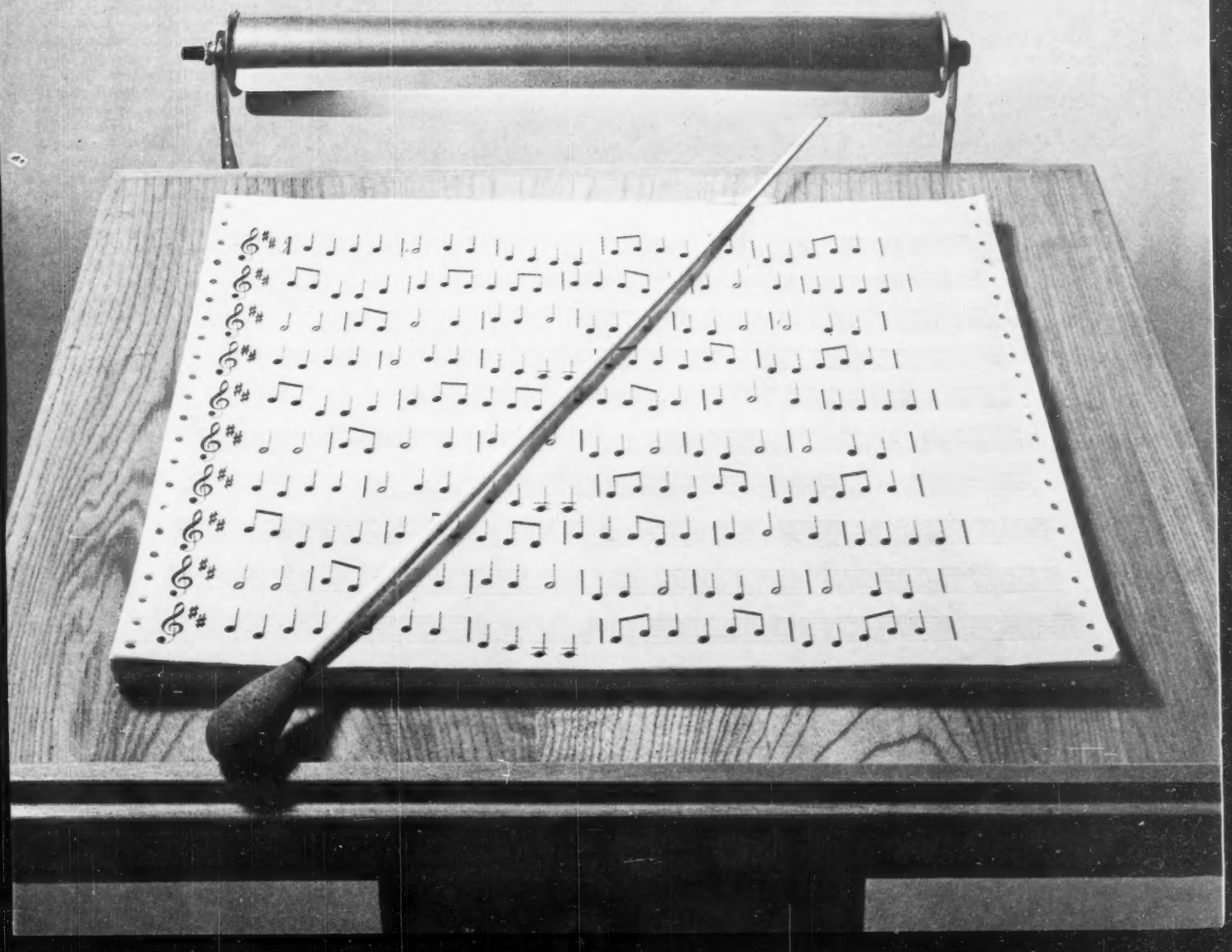

Foam Needs Figured

NEW CASTLE, Del. — A pair of programs available to industrial facilities planners on a service basis from Witco Chemical Corp. are said to help in specifying and installing urethane foam insulation on roofs and for tank insulation.

Users must provide information such as area, preparation details, heating degree days, latitude of building location and interior summer and winter temperatures. From that, the roof program, for example, calculates data to specify a new or replacement roof, including annual insulation and heating costs.

Further information on the programs is available from Witco's Isocyanate Products Division, Department 1566, 900 Wilmington Road, New Castle, Del. 19720.

With DG Hardware

'Tips' Manages Word Processing

PALO ALTO, Calif. — The Text Information Processing System (Tips) from Information Processing Techniques Corp. (IPTC) is a CRT-oriented word processing package for Data General Corp. minicomputers.

It supports a command language — "including all features in standard text editors" — and an explicit blinking character pointer, a spokesman said.

Tips also provides form letter and address file facilities, including flexible formatting and the use of both upper and lower case print characters.

System files on disk can be merged into the user's text work area and the system has a "fill-in-the-blanks" feature for skeletal documents.

Once users have created the documentation they want, the system provides protection against the inadvertent loss of text work area both from system crashes and from misuse of Tips, he noted.

An optional hardware pointer device for fast positioning and modifying of character strings enables a writer to resequence phrases and sentences, he added.

Tips can be used on DG equipment with any of the standard operating systems. CRT terminals are used for input while line printers are supported for interim output and "serial quality typing units" are supported for the final, polished output, the spokesman said.

Tips costs $2,400 with quantity and OEM discounts available. The cost of the optional hardware pointer was not provided.

IPTC is at 1070 East Meadow Circle, Palo Alto, Calif. 94303.

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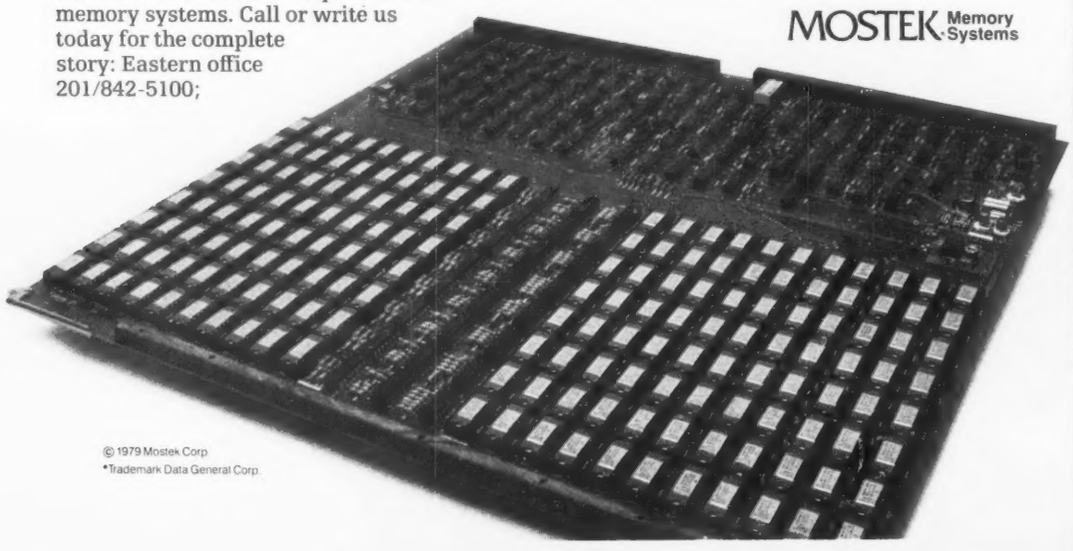

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Package Aids Intel Users

SPRINGFIELD, Va. — A fast disk copy program for the Intel Corp. MDS family of development systems is now available from Xener Corp. It runs under the Isis-II operating system and will copy an entire single- or double-density diskette in less than a minute, the vendor claimed.

Since copying is done at a binary code level, users are not limited to copying Isis-II diskettes — they can copy any standard format diskette, according to a spokesman. The user may optionally specify that the object diskette is to be formatted. Verification of the object disk can also be specified, he said.

With the Xener program, a user is capable of copying a diskette to itself with formatting. With that capability, any soft errors will be corrected, allowing access to the data once again even if there was a bad sector on the original diskette.

Xener's disk copy program costs $60 and is available on either a single- or double-density Isis-II diskette from Xener at 6641 Backlick Road, Springfield, Va. 22150.

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Getting 10% More — Part 2

Real-Time Warnings Would Ease System Use

In Part 1 of this article, Zipp considered problems of unscheduled system software outages, sluggish performance and system resource management as they relate to running efficient systems. In this part, he discusses real-time operational problems, system warning functions and installation-unique problems.

By John Zipp
Special to CW

How do you find out if a job that requires large data files can be started? Today you may very well have to run a utility to find out how much space is available on your disk devices.

How do you place sort space for a huge sort to minimize the channel contention and to use contiguous space most efficiently? Today you probably don't do these things, not because you don't want to, but because the impact in time and dollars is greater than the potential return.

We have found that if system utilities are made available to the operations staff so the utilities can be used easily and in real-time, substantial efficiencies in space management and channel path optimization can be achieved. Such system utilities include space management and display, data set size and organization display and such device services as deallocation and allocation. The key to such systems is to make this information available at the systems console, where it can be used in real-time.

System Warning Function

Many installations have complained that the system simply came to a halt for no apparent reason, but upon analysis of the dump it was found that some system resource had been exhausted. If it had been known that the problem was developing, it could have been addressed.

For example, console buffers can become exhausted if a console is not in roll mode or if a hard-copy printer runs out of paper. In IBM's MVS operating system, CSA or SQA shortages can develop.

A system that could diagnose such developing problems and then give an advance warning to the operator could significantly reduce lost time and outages.

Every installation is unique and has specific problems that fall generally into the above areas. However, each installation does not have the systems programming staff or, more probably, the ability to expend critical system programming resources to develop such tools, even with their substantial return.

We feel that a software vendor should take this real-world situation more into account in the product development cycle. Products which are so designed that they preclude user tailoring and additions in the area of operational efficiency products do a disservice to the supplier and client.

The final way to get substantial potential benefit in the operations environment is to gauge the progress being made in attacking sluggish performance and real-time outages.

Immediate Payoff

It is immediately useful to know that the reason the machine has stopped is because of an enqueue conflict, but an installation should have the capability to determine through an automatic test-and-log facility how often problems develop that do not become apparent to the operator, but have nonetheless caused degraded performance.

How could you go about getting 10% to 30% more through your system?

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To attack IPLs without providing relief from system inefficiencies in using system resources will only provide partial relief.

Zipp is vice-president of sales for the Operations Division of Boole & Babbage, Inc., Cupertino, Calif.

Regional CMG Plans N.Y. Meet

NEW YORK — The Northeast Computer Measurement Group (NECMG) is planning a day-long meeting with five separate technical sessions at the Price-Waterhouse & Co. offices in Citicorp Center on Friday, Feb. 2.

Morning sessions will consider hardware monitor applications as well as multivariate methods and their applications to computer performance evaluation, according to NECMG Chairman Jeff Buzen of BGS Systems, Inc.

In the afternoon, discussions will focus on using scheduling data for computer resource management, reporting performance measurement data to management and simulating working sets under MVS, Buzen added.

There is a $3 registration fee. Anyone planning to attend is asked to contact Buzen at BGS' offices, 470 Totten Pond Road, Waltham, Mass. 02154, or through P.O. Box 128, Lincoln, Mass. 01773.

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NEW YORK — In the highly competitive world of banking, offering extra services to customers has usually meant hiring more people, conducting more extensive training programs and absorbing greater overhead costs. Now, however, two New York banks — the Metropolitan Savings Bank and the East River Savings Bank — have found a way to increase both their service and efficiency levels while actually reducing labor costs.

The key to this unusual capability is the computer hardware/software package employed by Banking Data Systems (BDS), a Brooklyn-based firm that compiles, stores and retrieves bank management-related information.

BDS' on-line transaction processing system, written in Cobol, runs on a Honeywell, Inc. 2060 front-ended by a Level 6 Model 43 minicomputer. The mini has 128K words of main memory, 256K bytes of disk storage and three multiline communications processors. It supports more than 500 tellers through more than 250 terminals.

On-the-Spot Services

The system enables each bank to process customer deposits and withdrawals, set up new accounts and change customer names and addresses on the spot. The on-line services also extend to lease-security and time deposits, club accounts, teller checks, and money orders.

A key element in the system is its automatic switching facility for checking accounts, which was instituted in May 1977. This feature enables both banks to transfer demand deposit accounting (checking) transactions from their computers to another system for on-line processing at the Savings Banks Trust Co.

Starting last Nov. 1, the banks also offered automatic funds transfer and NOW accounts to their customers. These two processes, which are invisible to both the teller and the depositor, required only the addition of a single function key to terminals already in the system. No additional system-related expense was incurred by either of the two banks.

Explained Bradley Hemingway, president of Metropolitan Savings Bank, "The system is designed around a central information file so we can do a better job of serving our 300,000-plus customers. It has definitely helped us achieve our goal of giving customers faster, more efficient, uninterrupted service while reducing the number of time-consuming manual operations required of our tellers and branch office personnel."

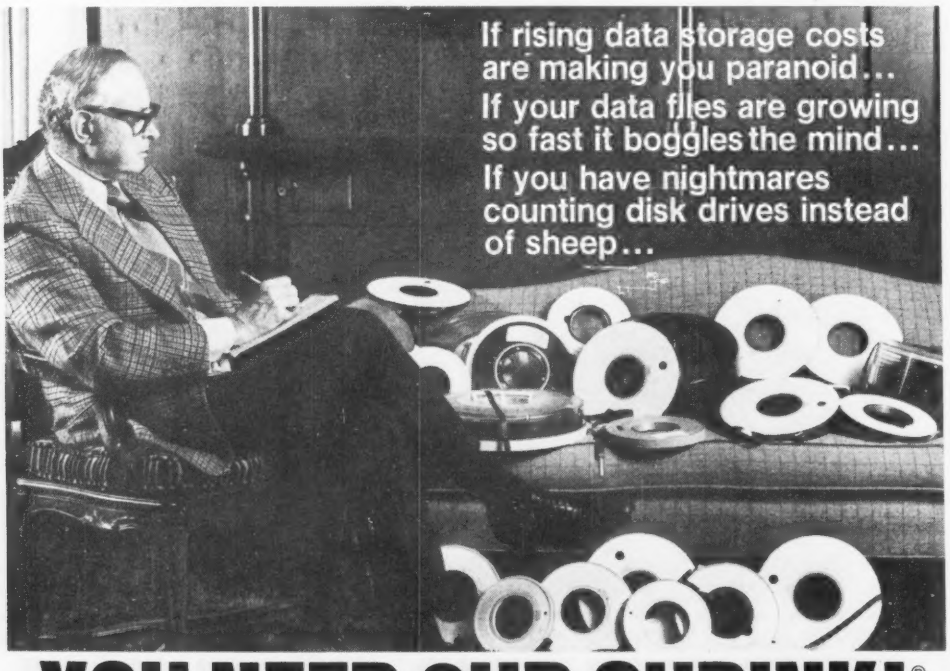
Teller Productivity Report

Although the system generates a wide variety of reports, BDS President James P. Roarty is especially proud of one that lists the number of teller transactions per hour per day, as well as the type and frequency of errors. "This report lets the branch managers know right away both the productivity levels achieved by the tellers and the areas in which they might require additional counseling and/or training," he said.

Customers at Metropolitan Savings appreciate the system's "check truncation" capability, which stops all over-the-counter check transactions at the branch level instead of moving through a central office checkpoint. A descriptive statement explaining the check's purpose subsequently appears on the customer's monthly statement.

It is no longer necessary to add to the staff as the number of checking accounts grows, and that is a benefit that appeals to management at both banks. "At one time," Hemingway recalled, "there was a rule of thumb that said for every 2,000 to 3,000 accounts you establish, you must add one new employee. At one time, we had 20 people handling 22,000 accounts.

"Now, we have one person handling almost 40,000. Perhaps even more important, we'd still require only one person even if we reach 100,000 accounts. The system is that efficient and, to my knowledge, it is the only one that offers the automatic switching capability."



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More than Just a Promise

Fiber Optics a Reality for Data Users

By Ronald A. Frank
CW Staff

W. BOYLSTON, Mass. — Fiber optics for data communications is much more than just a promise. It is here today and available for daring users.

One of only two commercial suppliers, Valtec Corp. here has already installed 150 fiber optic data links at user sites despite claims from industry sources that the light-based technology is not yet a commercial reality.

"You have your skeptics," Stephen C. Lang, senior marketing specialist, admitted. Lang advises users on the features of the firm's data links, or "data modems," as Valtec prefers to call its point-to-point data communications products.

The modems convert digital output from a terminal into light waves, which are transmitted at high speed to a similar modem that converts the light back to digital form for input to another terminal or CPU. An LED is used to convert the electrical signals to light signals for transmission, and a photo detector receives the light signal and translates it into a digital pulse, Lang explained.

A typical Valtec fiber optic modem costs about $600, which is close to the price of conventional short-haul data sets. The average link being installed operates at a distance of 300 to 400 feet and costs the customer about $1,500, he said.

The optical data links, aside from incorporating a new technology, have some important operating advantages over more conventional copper wires. The glass cable is free of noise or other types of electrical interference and can be installed next to power cables without any problems. The data links can operate at distances up to one kilometer without repeaters using medium-loss optical cable. And if low-loss cable is used, that maximum distance can be increased to almost three kilometers, Lang said.

The links coupled together act as repeaters for longer distances.

Two Types of Links

Valtec has two types of full-duplex point-to-point links. An RS-232 type handles speeds up to 20k bit/sec and a TTL version can operate at speeds to 10M bit/sec. Users decide which system they need based on transmission speed. While the RS-232 model obviously makes use of standard pin connectors available on most terminals, the TTL unit uses cable connectors that can be handled easily by most customer equipment, Lang said.

Exploding another misconception, Lang said that although splicing fiber optic cable is a precise process, it can be done by a user with a minimum of training. Even if the splice causes a 1-db loss in the cable, the effect on data transmission is minimal because there is plenty of spare bandwidth in the typical link, he said.

At present, Valtec systems are limited to full-duplex point-to-point operation between single units, but later this year the firm will introduce an optical multiplexer that will be able to combine multiple data streams from input terminals on one link. Lang would divulge few details about this multiplexer except to say that it will handle somewhere between 10 and 20 inputs. It is believed that one optical multiplexer is currently an announced product from a division of ITT but it is not known whether any of those units are operating commercially, he said.

Most of the fiber optic links installed by Valtec run underground but there is no reason why they cannot be run in the open like telephone wires on poles. And they can be bent like metal cable.

"Today we are still using converted electrical connectors" for fiber optics applications, Welty Trout, a Valtec engineer, explained, but he noted that connectors designed specifically for this type of transmission will soon be available.

A cable splice kit costing about $165 has been introduced. It involves little more than correct alignment and a drop of epoxy so that almost anyone can use it, Trout said.

Many DP vendors have shown an interest in Valtec's products, and the firm is supplying many of them with its fiber optic cable on an OEM basis. Up to now, few optical products have been introduced by other vendors. Hewlett-Packard Co. has a data link but the user must supply a power source.

On the horizon, Trout sees precision connectors specially designed for dual-channel (full-duplex) cables that can be field installed.

At present there are few standards for fiber optics systems but most cables use 8- or 10-mil conductors, Lang said.

One of the more publicized Valtec installations is at the MGM Grand Hotel in Las Vegas. A 4.2-kilometer fiber optic cable serves as the main trunk line between the hotel's switchboard and the central office of the local telephone company. All incoming and outgoing calls go over this link, although few guests know it exists, Lang said.

In addition to Valtec, only Canoga Data Systems, a West Coast vendor, supplies fiber optic data links for commercial users. But Lang has no doubts about the technology being here to stay.

One of Valtec's current goals is to reduce the 10-week delivery time on new systems.

Memotec Brings Out Processor For Packet-Switched Networks

By Brad Schultz
CW Staff

MONTREAL — A data communications processor providing user selectability and support for a range of protocols in X.25-compatible packet-switched networks has been announced by Memotec Services Corp.

The Mpac 5000 processor can join any micro, minicomputer or mainframe with any type of terminal, Memotec claimed. The unit accepts up to 16 terminals. It offers a "transport protocol" to optimize linkages and channel-sharing as well as optional encryption and data compression/expansion packages.

Such parameters as transmission rates, character length, parity and start/stop bits are user-selectable prior to or after installation, the vendor noted. The rate of each interface is individually selectable.

Memotec said the Mpac 5000 was designed to operate for extended periods in an unmanned environment.

Within such X.25 networks as Telenet or Canada's Datapac, the processor supports up to two High-level Data Link Control (HDLC) access lines at speeds in the 1,200- to 56,000 bit/sec range. The second line permits peak load traffic distribution, minimizes queuing delays and provides hardware redundancy, the vendor explained.

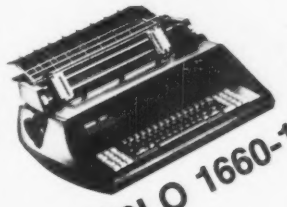
The Mpac 5000 reportedly accepts asynchronous terminals at 110- to 9,600 bit/sec and synchronous terminals at 56,000 bit/sec or less under such protocols as asynchronous teletypewriter and IBM 3270, 2780 or 2741.

The unit is plug-compatible with Bell 103 and 213 modems or equivalents and is designed for installation without change to user hardware, system or applications software, Memotec continued.

Provides Statistics

The Mpac 5000 command language reportedly allows display of system and local device status and provides such system statistics as packet counts. The language also allows the user to connect or disconnect lo-

(Continued on Page 34)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Swift International Bank Network to Expand

By Ivan Berenyi
Special to CW

Seven Latin American countries — Argentina, Bolivia, Brazil, Ecuador, Chile, Mexico and Venezuela — are to be linked into the Swift network for international banking by late 1980 or early 1981.

"Latin America, as a whole, is showing interest, and we hoped the seven major countries will be accepted by the Swift board in February," Barry Zabell, Swift's service information and security manager, said.

The Latin American countries will be hooked into the network via the new U.S. switching center which will be located in Virginia, according to Zabell. "The third operating center, which will be functional in early 1980, will have dual Burroughs Corp. B4800s like the existing centers in Amsterdam and Brussels," he remarked.

"It will give us a great deal of added capacity, taking us up to 375,000 messages a day," Zabell added. "Based on current traffic growth projections, it should suffice until 1983, 1984 or beyond. No more hardware changes will be needed in the near future."

Expanded Membership

The Swift network currently has nearly 600 member banks in 17 countries — the original 15 European and North American countries plus newly joined Japan and Ireland, which have not yet been cut over. Japanese membership totals 42 banks. In addition, 10 foreign banks which are already Swift members want to link their Japanese offices to the network.

Talks are in progress with the Japanese telephone company, Kokusai Denshin Denwa, concerning the installation and connection of a concentrator. The Japanese link is expected to go live in early 1980, using the U.S. switching center vis trans-Pacific lines.

Spain, Greece and Hong Kong have also been accepted as members by the Swift board and Singapore, Australia and New Zealand are expected to follow. "We are planning to connect Spain, Greece and Hong Kong early in 1980," Zabell noted.

"Beyond that, the timing depends on what technical service we'll be operating and how we'll plan the network."

American banks, after a slow start, are now second only to West Germany in use of the network, accounting for 14% of all messages. In terms of penetration percentage of possible Swift transactions actually sent via Swift, the U.S. is estimated to be second, with 50%, compared to Austria's 60%. West Germany has only 35%.

International Deals

"The Americans have more than 100 members; only Germans have more," Zabell declared. "There are, of course, more than 13,000 banks and financial institutions in the U.S. But only about 200 of these deal with international transactions in any volume. We already have 100 or more at the top end, so there's not much action left there.

"Current membership includes all the large banks in each member country; we are quickly coming to an end of the spectrum in these countries," Zabell said. "Unless the smaller banks switch to international transactions in a big way, our really large expansion will come from new areas. We can certainly count on 200 banks from Latin America."

According to Zabell, 414 Swift Interface Devices (SID), the Swift-approved terminals or front ends, are in use. But he admits that "there are increasing numbers of machines coming on the market that offer a Swift interface. Most of the computer manufacturers have concluded that Swift is here to stay and think they should have an interface to it if they are to count in banking."

Swift estimates that 20% of SID users have two devices and a handful have three. Belgium's Societe Generale de Banque will shortly become the first bank with four SIDs. This means that no more than half the member banks have picked SIDs.

The rest have opted for manufacturers' software links like IBM's Direct Swift Link (DSL) or turnkey interface packages like the one offered worldwide by the UK's Arbat software house. The Arbat package offers an optional link with the New York-based interbank clearing house system, Chips — an advantage for U.S. banks.

Official Suppliers

Of the official SID suppliers, Burroughs leads with 214 customers and General Automation, Inc., (GA) is second, with 180. In the U.S., there are 64 Burroughs users and 16 GA SID users.

The third supplier, originally Singer Business Machines, lost customers during its takeover by ICL, Inc., dropping from 80 or more initial signatories to 20 — 10 in West Germany, five in Switzerland, two in the UK and one each in Belgium, France and Ireland. The overall total units is estimated to be near the 530 mark.

By the end of 1978, the network was averaging 120,000 message/day. (The December average is not yet available, but in October the count was 109,000 and in November 117,000.) This is more than double the throughput logged a year earlier after the first U.S. banks were cut over.

"At this stage, I would say that 75% to 80% of banks make effective use of Swift, according to our traffic records," Zabell claimed.

"At the beginning of 1978, you could still see cases in which a single bank was taking up as much as 50% of all the traffic generated by one country, but not any longer. No country is dominated today to that extent," Zabell said.

Much depends on the outcome of a charge which Swift has filed with the European Commission alleging monopoly abuse by European postal, telephone and telegraph authorities. This follows a decision by the European Post and Telecommunications Union to quadruple line costs to Swift by introducing a per-message charge in addition to the original flat fee.

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Firm Offering Maintenance For IBM 3600 at 25% Less

WHITE PLAINS, N.Y. — A firm here is offering users of IBM 3600 financial point-of-sale (POS) terminals maintenance at rates that reportedly undercut IBM prices by 25% to 40%.

Technical Support Service, Inc. (TSSI) was founded to meet the needs of IBM terminal users in the banking community. However, the firm plans eventually to serve other users as well, according to President Thomas McLaughlin. TSSI is initially focusing on systems too seriously damaged to be serviced in the field, he added.

TSSI offers maintenance capabilities that match those of IBM repair centers but, unlike IBM, will render preventive maintenance, McLaughlin claimed. The firm will handle IBM 3603, 3606, 3604/1, 3604/2, 3604/-5, 3604/6 3606 (all models) and 3608 terminal systems for 252% less than IBM rates, he said.

Users of IBM 3604/3, 3604/4 and all 3610 models located within 200 miles of White Plains can reportedly save 40% on maintenance. TSSI vans will transport their systems to and from the White Plains facility.

Normal 3604/1 maintenance costs $8/mo at TSSI, but $12/mo at IBM, McLaughlin said. Under the 200-mile depot plan, 3610/4 service costs $12/mo at TSSI, but $21.50/mo at IBM, he added.

TSSI will soon offer IBM 3651 and 3653 service to retail POS and electronic cash register users, respectively, and hopes eventually to tackle general-purpose IBM 3277 and 3278 terminals at a 50% savings over IBM.

The independent plans to open service depots in all major U.S. metropolitan areas. Moreover, users located far from TSSI depots may elect to ship their systems through Federal Express or similar 24-hour parcel carriers. TSSI would then ship the serviced systems back to the users by the same means.

TSSI is at 636 N. Broadway, White Plains, N.Y. 10603.

Processor Aids Packet Users

(Continued from Page 33)

cal devices to or from remote peripherals and can revise "packet formation parameters."

The optional data compression/-expansion is intended to minimize transmission time; it employs a three- or four-character stream to represent any repeated character string of three to 255 identical characters.

The basic unit with four asynchronous/synchronous ports and two HDLC access lines costs about $3,500 (U.S.) FOB Montreal. A fully configured unit with 16 asynchronous/synchronous ports and two HDLC lines costs about $5,400 (U.S.) FOB Montreal, Memotec said from Suite 300, 407 St. Laurent, Montreal, Quebec, Canada H2Y 2Y5.

ECR Helps to Consolidate Inventory and POS Data

MAYNARD, Mass. — Retail merchandise control applications are addressed by Data Terminal Systems, Inc.'s (DTS) Model 550 stand-alone electronic cash register (ECR) which, with communications option, can consolidate inventory and point-of-sale (POS) data within the store for direct transmission to a remote CPU.

Remote applications do not require the presence of any controller or processor at the store level and incur about half the cost of a conventional POS communications network, DTS maintained.

The Model 550 can reportedly handle inventory records on up to 3,500 merchandise items, with expansion to 19,000 items planned for the "near future."

Moreover, the Model 550 was said to offer comprehensive sales analysis capabilities, providing descriptive information from a 20-character alphanumeric CRT that can be used for cashier, manager or customer messages as well as from a three- or two-station alphanumeric printer.

DTS also announced the Model 515 ECR, also aimed at merchandise control. The system offers sales classification and reporting, cashier lead-through by display and optional optical character recognition (OCR) through OCR-A wands, DTS said, noting the cashier lead-through indicates the cause of cashier ring-up errors on the CRT.

The Model 550 costs $3,790, including interregister communication and 512-record memory. The Model 515 costs $3,495, including these same features.

Data Terminal Systems is located at 124 Acton St., Maynard, Mass. 01754.

Valtec Unveils Six-Fiber Cable For Long Hauls

W. BOYLSTON, Mass. — Valtec Corp.'s Communications Fiber Optics Division has added an armored 6-fiber multichannel cable intended for long-haul, high-bandwidth applications to its Fiberdata series of telecommunications cables.

Designated Model TC-MG05-06, the cable can reportedly be installed with conventional coaxial cable pulling equipment in a fraction of the time required for twisting wire-pair cables.

Each color-coded subchannel includes a dielectric strength member that imparts its strength to commercially available single-channel connectors, Valtec said, adding that corrugated aluminum sheathing protects the cable against water and crushing.

Options include steel sheathing to protect against rodents and copper conductors for electrical transmission. Depending on options, TC-MG05-06 costs less than $10/meter in the 10-kilometer range, Valtec said from W. Boylston, Mass. 01583.

Micom Users Offered Port Concentrator

CHATSWORTH, Calif. — Micom Systems, Inc.'s Micro 200 port concentrator was designed to allow users of Micom's Micro 800 data concentrator to save computer ports as well as telephone line costs.

Aimed particularly at minicomputer users, the Micro 200 allows one CPU port to communicate with up to 16 channels on a remote Micro 800 using a "very simple" asynchronous or synchronous protocol, Micom maintained. However, some user programming is required to use the port concentrator.

The Micro 200 costs $1,000, with quantity discounts available, and can be delivered within 60 days of order, Micom said from 9551 Irondale Ave., Chatsworth, Calif. 91311.

Multiplexer Designed For Naked Mini 4 Series

IRVINE, Calif. — A 4- or 8-channel multiplexer designed to facilitate asynchronous data transfers between Computer Automation, Inc., Naked Mini 4 series computer systems and local or remote RS-232-compatible devices is available from CA's Naked Mini Division.

The asynchronous multiplexer offers 16 programmable transmission speeds in the 50- to 19.2K bit/sec range. Data transfers are interrupt-driven with separate receive and transmit vectors for each channel, a spokesman said.

The device also features range detection and special character detection of two programmable characters for each channel, the spokesman noted.

The multiplexer is reportedly contained on a standard half-card that fits in any Naked Mini 4 chassis. Also included is an interface panel on a separate card that mounts on a 19-in. retma rack and provides standard connectors for device cables.

A 4-channel version of the multiplexer costs $995 and the 8-channel version, $1,495, CA said; deliveries are within 30 days of order.

CA's Naked Mini Division is at 2181 Dupont Drive, Irvine, Calif. 92713.

"With all the little companies peddling intelligent terminals these days, an OEM or a large EDP end user like me can't be too careful. Sure, they may be able to design a good terminal. But can they deliver it? Service it? Is the company's president also the service manager and the installer? So I did a lot of looking around. That's when I came across the MDT 400 manufactured by Compugraphic for applications like distributed processing, text editing, and data communications.

" 'CompuWho?' I said. But then I found out that Compugraphic is a $180,000,000 New York Stock Exchange company — the world's leading manufacturer of computer driven phototypesetting systems — with a nationwide field service force of over 300 service engineers.

"With Compugraphic I don't have to worry. Even though their MDT 400 lists for under $4,500, it's got everything I really need — full user programmability, hardware and software modularity, a powerful 8085 microprocessor, up to 32K bytes of memory, integral mini-disk, a disk operating system, and an optional printer. I can even get substantial quantity discounts. And they'll service it themselves all over the country for me.

"Listen, I'm not going to be burned by a company that can't deliver what it promises. The MDT 400 makes sense to me — and so does the company building and backing it. Maybe Compugraphic is a company *you* should get to know."

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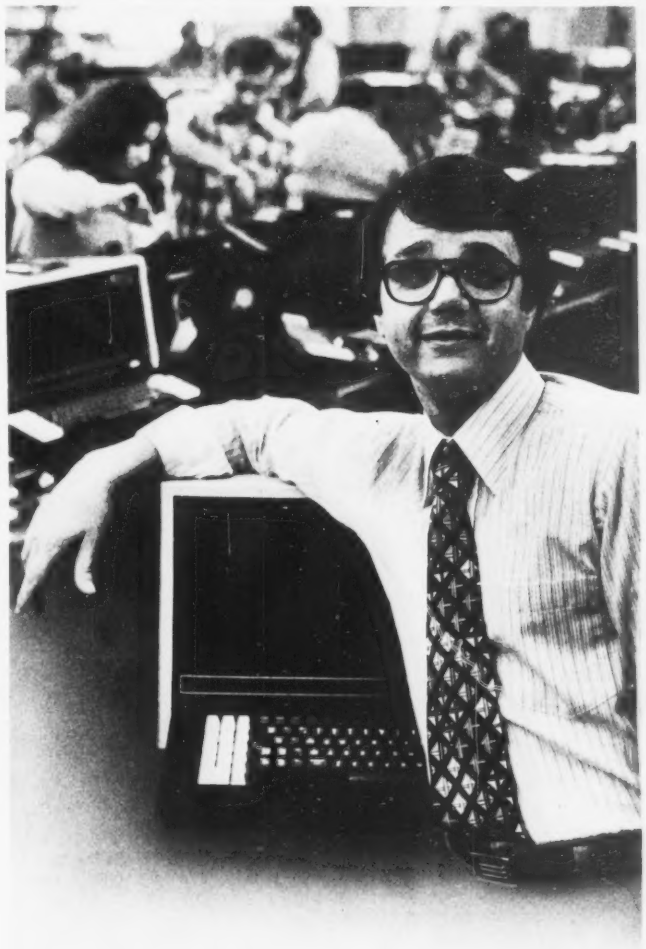

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CW179

Intelligent Printer Compatible With Major Mini Disciplines

ATLANTA — Technical Analysis Corp. (TAC) has introduced the COM/300 intelligent line printer.

The microprocessor-controlled, 300 line/min printer reportedly offers full compatibility with the three serial transmission disciplines (XON/XOFF, ACK/Nack, Clear To Send) used by minicomputer manufacturers such as Data General Corp., Digital Equipment Corp., Interdata, Inc. and Hewlett-Packard Co.

The COM/300 is said to have overcome the problem of compatibility with clear-to-send timing signals experienced by other remote printers. It operates like a DP center line printer but, unlike those parallel interface devices, can be separated from the CPU with the attachment of an RS-232 line or a modem, according to a company spokesman.

The COM/300 uses a Printronix printer that supports one- to six-part paper up to 16 in. wide and the full 96 Ascii character set including upper and lower case characters and plot mode.

The printer is said to work well with DG's Nova, Micronova and Eclipse, DEC's PDP-11 and LSI-11, Interdata's 516 and 732 and HP CPUs.

The Com/300 should work with any processor that provides an asynchronous interface. A readily available 4-wire cable and RS-232 connector is required to hardwire the printer to the interface and distances of 1,000 ft. can be supported.

The COM/300 can be used for printing bills of lading in the shipping area, producing picking tickets and packing slips in the warehouse and preparing customer orders and invoices in the accounting department.

The COM/300 costs $5,950, with 30-day delivery from Technical Analysis Corp. at 120 W. Wieuca Road N.E., Atlanta, Ga. 30342.

Terminal System Stores As Much as 972K Bytes

TEMPE, Ariz. — An intelligent terminal system offering as much as 972K bytes of floppy disk storage is available in single-station and dual-station models from Consolidated Computer International, Inc. (CCII).

The Key-Edit 22 single-station system includes a 64K-byte processor, 1,920-char. CRT/keyboard and two 243K-byte floppies. An additional two 243K-byte floppies are optionally available to yield a total of nearly one million bytes of disk storage; other options include up to two dot matrix 340 char./sec printers and a communications controller.

The Key-Edit 24 includes the 64K-byte processor, two 1,920-char. CRT/keyboards and four 243K-byte floppies (972K bytes total). Up to two 340 char./sec printers and the communications controller are optionally available.

CCII called the processor memory user-programmable for both versions and described the floppies as "standard IBM-compatible." Software features a high-level user programming language to expedite order entry and inquiry applications, the vendor said, adding that a data entry utility can specify error-checking requirements.

There is also a library of utility programs that sort or move data between peripheral devices and perform other data management tasks, CCII continued. These functions are controlled by a hardware-stored multitasking monitor system.

Depending on options, prices for the Key-Edit 22/24 terminal system start at $14,000. Lease prices start at about $350/mo., the vendor noted from 1604 S. Edwards Drive, Tempe, Ariz. 85281.

Xten to Be Discussed at Seminar

CAMBRIDGE, Mass. — Xerox Corp.'s Xten, the new high-speed, end-to-end digital communications service, will be discussed at a Yankee Group seminar entitled "The Impact of Xerox XTen" March 21-22 in New York City.

Scheduled speakers include Paul Silverman, Xerox Xten vice-president; Murray Copp, Digital Equipment Corp. communications director; and Gordon Matthews, "Wats box" inventor and Electronic Communications Systems president.

Also slated to talk are Charles Jackson, U.S. House of Representatives Telecommunications Subcommittee staff; Ronald A. Frank, *Computerworld's* deputy editor; Howard Anderson, Yankee Group president; and Dale Kutnick, Yankee Group market research director.

Xerox recently asked the Federal Communications Commission (FCC) for permission to offer Xten throughout the U.S., Yankee Group said.

According to Yankee Group, Xten is quite different from AT&T's Advanced Communications Service, Telenet and Satellite Business Systems' "digital capacity on demand" — although it "outwardly" resembles those alternatives.

Begin as Hybrid

Xten "will begin life as a hybrid." Xerox plans initially to only lease capacity from the existing domestic satellite carriers, although plans are set for the vendor's entry into "the satellite club," Yankee Group continued.

"Further, Xerox Xten will employ point-to-point microwave systems to carry these digital signals between earth stations and city nodes. The city nodes will use the electronic message service spectrum and other local loop options to communicate with local subscribers."

Hardware Focus

The seminar will focus on the types of hardware Xerox may introduce to complement Xten. "Xerox — as AT&T — promises many things to the user . . . [for example,] full store-and-forward capability on message traffic, allowing the user to optimize this network labor cost while providing the maximum of human engineering."

The seminar at New York's Harvard Club will cost $550 for the first registrant and $450 for each additional registrant of a party. Further information is available from Kate Cogswell-Carr, the Yankee Group, Harvard Square, P.O. Box 43, Cambridge, Mass. 02138

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Data Link Solves Service's Relocation Woes

BETHPAGE, N.Y. — The relocation of a data center can provide benefits for those who manage it, but it can also pose problems for end users at the original site. Calldata Systems, Inc., a subsidiary of Grumman Data Systems here, solved that dilemma with communications and a PIX-II "virtual data link" from Paradyne Corp. of Largo, Fla.

Calldata provides time-sharing services to Grumman Aerospace Corp., another Grumman subsidiary here, as well as to commercial customers. Until December 1977, Calldata operated mainframes here, in nearby Woodbury and in Waltham, Mass.

The firm decided to consolidate in Newton, Mass. There, Calldata installed two Amdahl Corp. 470V/5 CPUs — one for batch-oriented customers operating under VS and the other for time-sharing customers operating under VM. A T-Bar switch provides peripheral flexibility between systems.

Prior to that consolidation, Calldata shared an IBM 370/168 Model I in Bethpage with Grumman Data Systems. That system, running under VS, provided batch services for commercial customers. VM users were served by two additional Calldata mainframes in Bethpage: a 370/155 Model II running VM and a 360/67 running a modified version of CP/CMS. That processing workload was transferred to the Amdahl machines in Newton.

In addition, Calldata supports the workload from a 370/155 Model in Newton, formerly operating at Systematic Data Processing Services, a Calldata subsidiary in Waltham, Mass. A Honeywell, Inc. 635 running Dartmouth Time-Sharing Service (DTSS) in Woodbury, N.Y. was replaced by a Honeywell 66/07 installed in Newton.

Handling Requirements

"One of the primary considerations in that relocation was how to handle the high-volume output requirements of our customers at Grumman Aerospace, which is located within the same complex here in Bethpage," Ken Malecki, associate systems analyst at Grumman Data Systems, said.

"The real-time response advantages to Grumman Aerospace would be lost if processed data had to be trucked or air freighted from Newton to Long Island," he explained, "and the volume of output required far exceeded the capacity of teleprinters."

According to Ira Bland, Calldata's manager of systems programming, implementation of IBM's Network Job Interface (NJI) option would have been the ideal solution: "That would have given us our original capabilities and then some."

"We could have transferred complete files in either direction between the Amdahl machine in Newton and the 370/168 we formerly shared with Grumman Data Systems in Bethpage. Each location would have had a remote printing capability," Bland said.

He estimated, however, that implementation of NJI would have taken his department approximately six months because of the extensive modifications to Hasp that would have been required.

"At that point, we began to consider a remote job entry (RJE) link between Newton and Bethpage," Bland continued. "We soon discovered two problems in that approach. One was that our existing VM configuration would allow us to attach only one printer in Bethpage to the RJE link. We decided it would not be worthwhile to take the time required to make those modifications."

Problems Solved

Grumman solved these problems with the PIX-II data link. That self-contained data communications system, incorporating processors at both locations, permits printers and unit record equipment installed in Bethpage to operate as if they were locally attached to the Amdahl VM machine in Newton. PIX-II eliminated the need for teleprocessing software in the mainframe and, therefore, the overhead that software would normally impose on the mainframe.

"There were no additional software requirements, and there was no need to modify our existing operating system," Bland explained.

The data link consists of two minicomputer-based control units. A local control unit (LCU) attaches directly to the 470V/5 byte multiplexer channel through the T-Bar switch at Calldata headquarters in Newton. That LCU communicates over a 56 kbit/-sec private line to a remote control unti (RCU) in Bethpage. Intervening Micom Systems, Inc. multiplexers at either end provide the RCU with two 25K bit/sec lines.

Attached to the RCU in Bethpage are a 9-track, 1,600 bit/in. tape drive and an IBM 3277-type CRT, both supplied by Paradyne, and an IBM 2911 peripheral switch through which unit record peripherals are accessed. Those devices include three IBM 2821 printer controllers, three IBM 1403-N1 printers and an IBM 2540 card reader/punch.

Bland said the ability of the system to support 3277-type terminals proved especially helpful. "We had to make some provision for an operator in Bethpage to control the printers and unit record equipment installed there. PIX-II support of 3277 terminals presented an inexpensive solution. Otherwise, our alternatives would have been use of a low-speed Ascii terminal, which VM would not have supported as well, or a stand-alone 3275 at a tremendous cost increase."

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Monitor Labs Adds Data Logger Options

SAN DIEGO — Monitor Labs, Inc. has announced an alarm option and annunciator panel for its System 9300 data logger.

HI HI, HI and LO limits can be individually assigned to as many as 140 channels with those products, according to the vendor. Larger systems — up to System 9300s with 1,040-channel capacity — can be handled by setting individual limits for the first 40 channels and then assigning common limits to the remaining channels in groups of 10.

Limits and output relays are assigned in engineering units by entering them through the System 9300 keyboard. "English language" programming and an alphanumeric display are said to simplify limit-setting.

System 9300 software reportedly allows the user several choices in the way alarm data is output. Out-of-limits channels can be recorded and/or annunciated on each scan or recognized only upon transition into or out of limits. Moreover, a deadband may be set to prevent "nuisance" recordings if a channel is hovering just above or below a designated point, the vendor continued.

The System 9300 logger outputs to cassettes, magnetic tapes, page priners and CPUs. It also displays and prints alarm data. In addition, there are options for annunciating up to 256 alarms with the annunciator panel.

Aside from lamp indication, optional relays capable of switching 10A inductive loads can be activated in response to alarms and can be in either the latching or tracking mode.

The alarm option costs $500, the annunciator panel costs $900 with 16 lamps and relays are priced at $35 each. Monitor Labs is located at 10180 Scripps Ranch Blvd., San Diego, Calif. 92131.

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Systems Handle Air Time

CBS Goes On-Line to Manage 'Nothing'

By Howard A. Karten
CW Staff

NEW YORK — Could you use your computers to manage a business selling products that are all unique, have no weight, take up no space and yet are highly perishable?

CBS, Inc., the broadcaster, does just that. The products in this case are "spots" for commercials on the company's radio and TV stations. To manage them and other aspects of its business, CBS relies on eight large-scale mainframes with 41M bytes of storage.

And managing "nothing" is no easy task — the company is adding still more systems and memory to its current complement.

"When we don't sell a time slot, we can't just brush it off and sell it next week," according to James A. Walsh, vice-president for management information systems. When the air time isn't sold, "it's gone forever."

To manage the complexities of selling a particular time slot, which could be sold by a salesman in virtually any major city in the country, CBS relies heavily on its systems, in particular on the on-line systems that Walsh said handle 80% of the conglomerate's DP work.

In New York, the company uses two IBM 3033s, each with 6M bytes of memory, and an 8M-byte 370/168. The three systems, which run under MVS/JES2, are slated to receive additional memory soon.

These systems are supplemented by an IBM 370/165, a 370/155 and a 370/158 AP in Terre Haute, Ind., and by a pair of 370/148s, each with 2M bytes, in Los Angeles. The 148s will be replaced by two 4M-byte 3031s in the spring.

According to John Lalli, director and general manager of the CBS data center, some of these systems are used in selling time on each of the AM, FM and TV stations CBS owns and operates ("0-and-0s," in broadcasting parlance). Others keep track of network time sales.

The CBS sales offices across the country use the dual 3033s as a major sales tool. They contain demographic data for each CBS outlet as well as data about its competitors. That enables the CBS sales force to prepare models for each prospective advertiser that show the most effective way to reach an audience.

"When we make a proposal, we

(Continued on Page 40)

Microcode Fundamentals — Part 1

Control Store Means Flexibility

By Mike Senft
Special to CW

Computer users generally view their systems as a collection of hardware and software tools that permit them to do their work. The architecture of the system — the way it interprets and executes commands — is something that has been built into one (or more) of the cabinets by the system's engineers.

In judging computer systems for possible use and purchase, most users consider the control unit and instruction set as a "given" and don't bother to evaluate it, exploring instead the system's output, modularity, cost, speed and other factors.

However, a growing number of users recognize that these "givens" can, in fact, be as modular and flexible as other components.

The control unit of a computer system is the interpreting element and the coordinator of the other major components. In a hard-wired system, the control unit interprets a machine language instruction, causing a predetermined sequence of events to occur.

Changing the sequence of these activities, enhancing or diminishing the power of the system or adding additional instructions to the system's repertoire, therefore, requires hardware changes, and possibly additional circuitry support, on the control unit.

Although the term "microcode" appears throughout computer literature, relatively little understandable information on the subject is available to most people in the DP field. This three-part series is meant to provide a simple but comprehensive introduction to the subject and to highlight the benefits of microcode to both the user and vendor.

In first- and second-generation systems, main store memory speeds were slow in comparison with internal system logic speeds. System designers reconciled this speed differential by having as many activities as possible occur between main memory clock cycles, when data or instructions were being fetched.

(Continued on Page 43)

Add-On Cuts 370/155 Turnaround

Special to CW

CHICAGO — By adding a fourth megabyte of storage to an overworked IBM 370/155, a national computer service company here has managed to improve turnaround time by 50%. The 4M bytes now on the leased system — all of which were supplied by an independent memory maker — are double the amount of storage IBM supplies for that system.

Since adding the last megabyte of memory in June, nine-year-old Computer Research Co. has had "maybe" five hours of downtime attributable to that component, according to Michael Driver, vice-president for operations. The service on the system, supplied by Raytheon Service Co., has been equally good, Driver added.

The company, which offers both on-line and batch services to its clients across the U.S., uses two mainframes: the 370/155 operating under MVT and an IBM 3033 running under MVS.

The company began its on-line service last February, and customer response soon grew to the point where the mainframe was overworked, degrading some customer services. To ameliorate the problem, the company turned to Cambridge Memories, Inc. (CMI) for the latest megabyte, CMI's Stor/155 core memory.

This provided more memory for batch processing jobs, freeing up some memory for on-line jobs, Driver said.

(Continued on Page 44)

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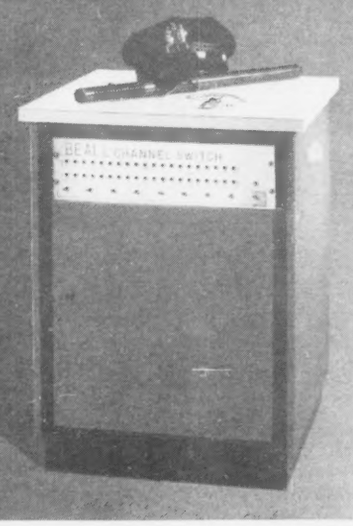

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CBS Manages Air Time With On-Line Systems

(Continued from Page 39)

simulate it in competition with other stations in the areas. We have the capability of making instant plans — in seconds, we can make a plan for an advertiser who might propose to spend millions of dollars for ads targeted to reach a particular audience. In a matter of seconds, we can calculate a suitable arrangement," according to Walsh.

The media system goes beyond merely keeping an inventory of available time spots, Walsh indicated; it also shows whether the proposed ad has been cleared by CBS' Programming Practices Department for suitability and whether there is any conflict between the ad and the program matter. This helps CBS avoid a broadcasting faux pas, such as having a soft drink commercial in a documentary about tooth decay.

The system also holds an inventory of space two years into the future as well as a two-year history.

Centralized Support

The system for selling air time is in many ways typical of the way Walsh runs CBS' DP activities.

All systems and software support is centralized "for obvious reasons" — economies of scale, the skill levels of the people and so forth, according to Lalli. However, "our technical philosophy is a kind of distributive kind of philosophy," which intergrates DP technicians into the major DP-using divisions.

"Our whole approach to [management information systems (MIS)] is to involve these activities in the [division's] business plan. The MIS plan and the business plan were previously developed independently; now they're integrated.

"The idea of putting the [DP technicians] in the divisions is to make them part of that division," Lalli said. Most of the company's divisions have their own DP staff and DP director.

"We now have MIS people who are experts in areas like order entry and finance, and we have experts in manufacturing, order entry and other areas who have been brought into MIS.

"We like to say around here that MIS people don't develop systems, users develop them. MIS is just another business tool," he continued.

This philosophy has been a significant help to CBS in managing the business, Lalli indicated. "There's a very large requirement for consolidation of information in order to control the business. You can't consolidate when you're decentralized, although you can sell orders on a noncentralized basis," he pointed out.

The company also took advantage of centralization in developing some of its systems; for example, two of the company's publishing subsidiaries — Hold, Rhinehart and Winston and W.B. Saunders — use some systems and some code in common.

"We're pushing common system development," Lalli said.

That commonality is important on the hardware side as well, Walsh said. For example, all equipment is purchased and negotiated through the New York DP operation.

Disaster Plan

In addition, the company is engaged in developing a common disaster plan that would allow it to operate from any of the three DP centers in the event of a lengthy outage in any one of them.

"We started developing the plan five years ago, when there were no external alternatives [such as commercial backup businesses]. The cost then was so high we felt we could do it better. We have tested programs on the East Coast to make sure they will operate successfully on the West Coast; we are moving toward a common operating system [MVS]," Walsh said.

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User Adopts 6,250 Bit/In. Gear

Savings 'Significant' With Independent Drives

NAPERVILLE, Ill. — A large furniture manufacturer here replaced five 1,600 bit/in. tape drives from IBM with four 6,250 bit/in. drives from an independent and achieved "substantial" savings — just like the advertisements say.

"Because of their increased speed and other capabilities, our four Memorex Corp. tape drives can handle the same amount of work the five IBM 3420 drives used to handle. In addition, they've reduced the number of tapes needed for each job as well as operator handling time. Obviously, we are experiencing significant savings," Tim Tuntland, computer operations manager for Kroehler Manufacturing Co., said.

The Memorex 3226 drives are attached to the company's 1M-byte 370/148 through a Memorex 3221 controller. The drives, which were installed in February 1978, were put in "easily and with few problems," Tuntland recalled.

"It took about four hours to take out the old drives and install the new ones, which we think is extremely fast. Because the Memorex drives attached directly to our system, we had few problems. About all we had to do was the fine tuning," he stated.

In addition to the Memorex tape drives, the system has six Memorex 3670 disk modules, two Memorex 3673 subcontrollers and one 3672 controller. The system is linked with nine remote job entry (RJE) terminals in Texas, Illinois, New York, Mississippi and other states. Running under IBM's Systems Network Architecture (SNA), the system is used to process data on payroll, scheduling and manufacturing from the outlying plants.

Kroehler uses its system — which runs under DOS/VS with Vtam, DL-1, Power/VS, CICS/VS and the Network Control Program — for a variety of on-line, data base and batch applications. Typical on-line applications include accounts receivable, inventory, sales forecasting and computer scheduling. Data base applications include special price authorizations.

Batch applications include bill of materials, sales reporting, marketing statistics and general ledger and accounting.

Important as Backup

The Memorex tape drives support almost all applications. One of their most important functions is to back up on-line transactions going to disk. This ensures that transaction data will not be lost in the event of a power failure.

The decision to install the Memorex tape drives hinged mainly on their fast rewind speed and increased density, Tuntland said. The drives, which can support data transfer rates up to 781K byte/sec, have a 50-sec rewind time for a 2,400-ft reel and can read both 1,600- and 6,250 bit/in. densities.

"Before we installed the Memorex drives, we frequently had to run multiple tapes for one job. With the new drives at 6,250 bit/in., we never require more than one tape for each job. In short, we've saved money by eliminating extra tapes," Tuntland said.

"We could have upgraded our old tape drives to a higher density," he added, "but it would have cost us more than we are now paying."

"We've been quite satisfied with the Memorex tapes and disks," Tuntland stated. "In terms of how much information can be stored per dollar, they are very attractive to a company of our size. And the equipment has been extremely reliable."

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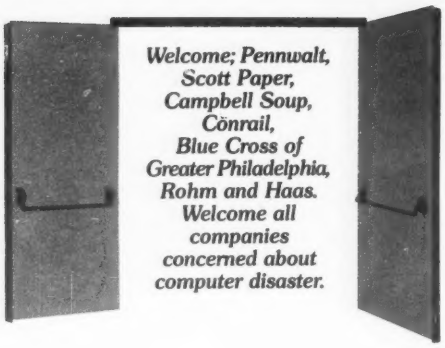

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6. Full center capability able to handle the entire load for most companies, and the critical requirements of even the biggest.

7. Full upgradability to maintain latest state-of-the-art. And plans to expand throughout the country with a fully-linked network of Sungard Centers.

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Sungard: the first concrete solution.

Control Store Offers Flexibility to User, Vendor

(Continued from Page 39)

This meant that each instruction was executing many tasks and getting a lot done, but the machine language programmer would often be frustrated by the inflexibility of the instruction set he had to use.

Control Store

With the introduction of third-generation systems (i.e., the IBM 360 line), IBM and other manufacturers took a more flexible path. Instead of completely hard-wired, predetermined logic, more flexible control units were designed to work in conjunction with an internal memory called control store.

In this design, when an instruction is fetched from main memory and executed, it effectively causes an internal jump to a location in control memory, rather than being interpreted directly by the control unit.

Resident in control memory are small interpreting routines, called microprograms, that aid in establishing the tasks and sequencing for the control unit. A microprogram could be as small as one microinstruction or as large as 20 such instructions; in any case, each microinstruction is executed in order, to accomplish the work called for by one main store instruction.

Although this method clearly increases the amount of time required to execute a machine language instruction, it means increased design flexibility for the manufacturer. In the case of the IBM 360, the intentional, built-in overhead factor was transparent since the new main memory was so much faster than previous generations.

Vendor Advantages

For the vendor, there are four major advantages to this approach: reduced design cost, reduced manufacturing cost, customer retention and long-term profit. Let's look at these advantages more closely:

• *Reduced design cost.* Microcode functions are much like a pencil and eraser in the design phase of a system; an error or oversight in a prototype can be rectified more rapidly by modifying software than by rewiring.

• *Reduced manufacturing cost.* Microprograms can work with physically different components — e.g., memory, I/O, arithmetic units — and still logically execute the same instruction to obtain the same result. Physically different devices can be looked at as logically equivalent to newer (or older) devices.

It is this versatility, in fact, that enabled IBM to build a "family" of systems, all program-compatible, but with different hardware (see Figure 1).

• *Customer retention.* By adding microcode or enhancing the existing microcode, different instruction sets can be interpreted and executed. This technique — emulation — can be used to execute the software of a machine differing from the host in word size, parity technique and hardware components.

Again, however, we find the typical power/flexibility trade-off entering the picture. To offset this often-occurring reduction in execution speed, brute force is sometimes needed; that is, many emulators are only made available on the most powerful machines of a computer family — the IBM 370/168, for example — in order to guarantee "real-time"-equivalent processing speed.

However, this performance reduction is often obscured by the fact that older systems are I/O-bound rather than CPU-bound. Thus, the performance improvement the user sees is really a function of increased I/O speed rather than CPU speed.

• *Long-term profit.* The use of microcode by a vendor can extend the life of a product and broaden market penetration because it accommodates future system enhancements, such as the upgrading of I/O devices, more easily than hard-wired logic. Control store can also be used as a very fast cache memory, wherein a small piece of system software can execute in order to reduce performance overhead.

Because of the elimination of layers of software between high-level languages and hardware, the user realizes increased speed and efficiency. Once again, it's still the same hardware as far as the manufacturer is concerned (see Figure 2), but to the user it's new.

Senft is director of marketing with Nanodata Corp. of Williamsville, N.Y.

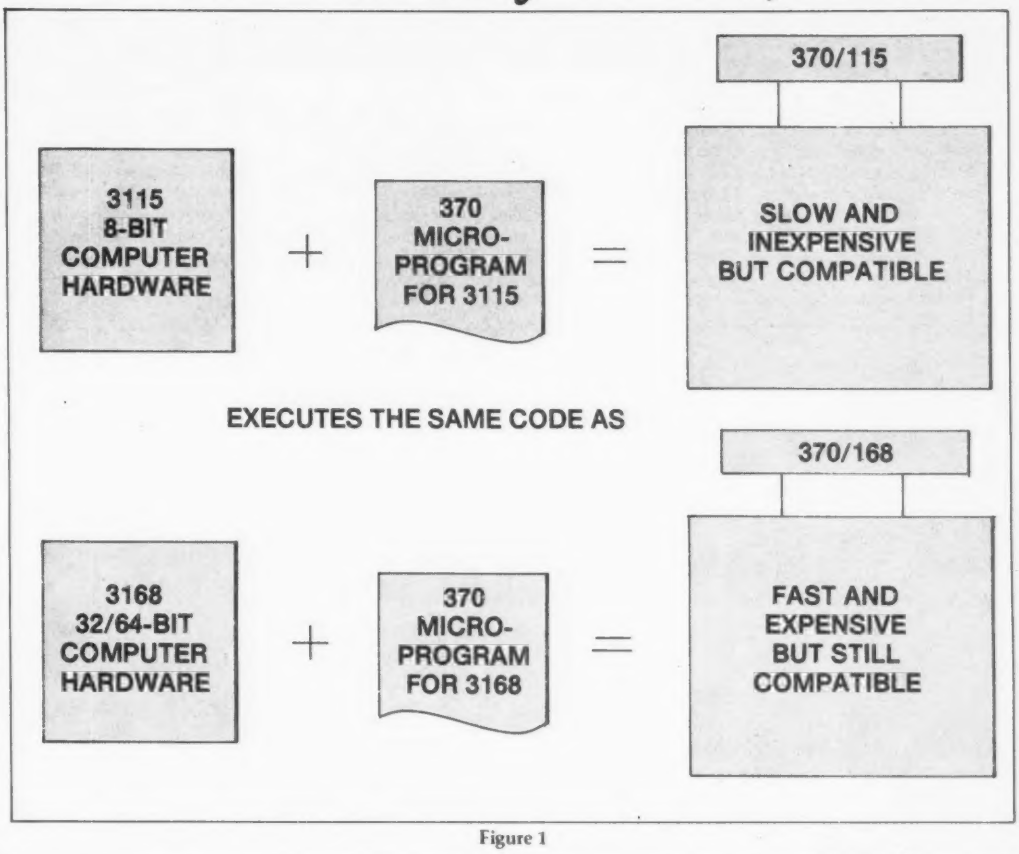

Figure 1

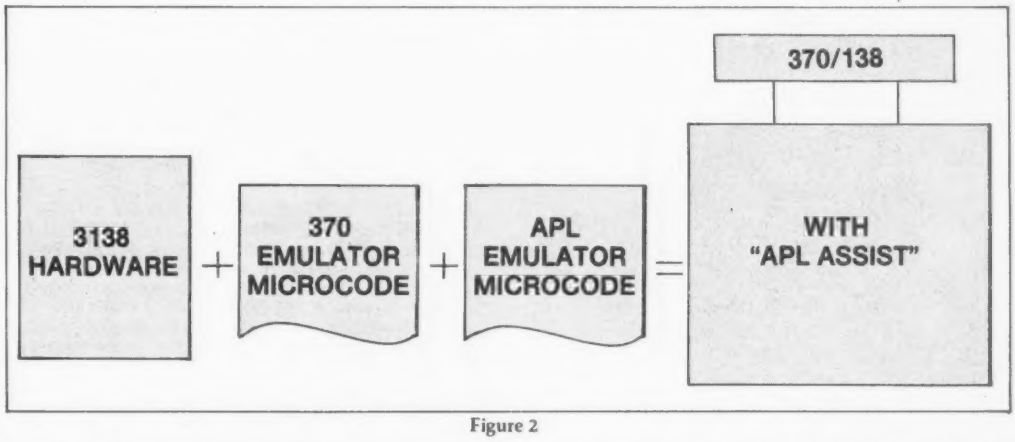

Figure 2

Vendor Literature Available Free to Users

Several vendors are offering users free literature explaining their products and how they can be useful to DPers:

• Honeywell, Inc. has two brochures explaining its distributed data processing equipment. The first, a 16-page, illustrated booklet about Honeywell's Distributed Systems Environment, explains how the vendor's equipment places DP power in the hands of users.

The second, a six-page folder, details how the company's large-scale Level 66 distributed processing system works with its Level 6 minicomputers.

The brochures are available from Honeywell at 200 Smith St., Mail Station 461, Waltham, Mass. 02154.

• A brochure from Nashua Corp. discusses steps in the manufacture and testing of disk packs, cartridges and diskettes. Also included are descriptions and specifications of the products manufactured by the company. Nashua Corp. is at 44 Franklin St., Nashua, N.H. 03061.

• 3M Co. has a brochure describing some of the company's microfiche and microfilm equipment. Specifications and pictures are given for 3M's SRC 1050 microfilm cameras, the Dupli-fiche system for microfiche duplication and the Model 800 reader/printer. The booklet can be ordered from 3M at P.O. Box 33600, St. Paul, Minn. 55133.

Add-On Cuts IBM 370/155's Turnaround Time

(Continued from 39)

"We have about 300 active customers and perhaps 500 more who use us for periodic large projects like program development. Most of the active applications involve accounting — payroll, general ledger, accounts payable and receivable — as well as engineering and other types of bank processing.

"Whatever the application, of utmost importance to me is that the customer get the fastest possible response for the situation, whether on-line, batch or time-sharing," he said.

Computer Research leased the 370/155 in October 1976 and installed 3M bytes of CMI's Stor/155 core main memory. As on-line activity grew with the implementation of IBM's Customer Information Control System (CICS), the company had to "borrow" portions of main memory from the batch processing area to give to new on-line applications.

Even though the initial 3M-byte installation was beyond IBM's 2M-byte limit for 370/155s, Computer Research decided to add another 1M byte of CMI core.

"We had an immediate need to improve service to our on-line users," Driver said. "In an on-line system, any kind of response degradation or downtime can create a severe problem, since the customer has on-line terminal operators who are getting paid to access an on-line data base. If they're not busy, the customer is losing money."

By adding the fourth megabyte of memory, the firm was able to increase its on-line processing region in mainframe memory to encompass a total of 700K bytes.

In addition, the company allocated more space to the processor's batch processing memory capacity, increasing the maximum number of concurrent batch processing jobs from five to seven.

Multiuser Operation

In typical multiuser operation, the CICS on-line system performance is a function of the amount of actual main memory assigned to the CICS operating region, Driver explained. During processing, the CICS system pulls into its region a working task for each user program.

When each task is finished, it is returned to its inactive storage area and replaced with the next task to be accomplished. By enlarging the CICS region, Computer Research was able to increase the number and scope of tasks that could be processed by CICS instructions at one time, reducing the system processing overhead activities associated with moving smaller tasks into and out of the CICS region.

According to Driver, Computer Research's use of on-line processing in the mainframe's application mixture is the primary reason the configuration can support more than the 2M-byte limit advocated by IBM.

"If this were totally a batch processing system, we probably wouldn't get such significant throughput by adding more core," because the 155's internal processing speed isn't fast enough to turn extra memory into higher batch throughput. But because our main memory need is for more on-line region space, extra memory does improve throughput by allowing on-line operations to be performed simultaneously on more user programs than before," Driver explained.

The benefits expected of the latest add-on proved to be realistic once it was installed. Still, Driver anticipated installation problems.

"I always expect problems to occur on a job like this," he explained. "As it turned out, though, CMI's technical people came in here with the memory upgrade kit and installed it on Saturday and the machine was up Sunday."

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Mini Bits

Single-Board Memory Intended for PDP-11s

ENGLEWOOD, Colo. — Separate parity controllers are unnecessary with a Monolithic Systems Corp. memory system that reportedly fits in any Digital Equipment Corp. minicomputer with hex-wide, modified Unibus connections.

If used with a separate parity controller, however, the MSC 3606 stores parity bits, according to a spokesman.

Intended for the DEC PDP-11/04, -11/34 and -11/60 minis, the single-board memory comes in 16K- to 128K-byte configurations with or without parity.

It also contains an on-board parity generation feature, parity checking circuitry and standard parity control status register, the source said.

Other features of the MSC 3606, which accesses in 450 nsec and cycles in 600 nsec, include DEC-defined battery backup, 1K-byte programmable address limits, 1K-byte switch-selectable I/O page boundaries and sockets elements that reportedly ease maintenance.

A 128K-byte MSC 3606 costs $3,030, with OEM discounts available from Monolithic at 14 Inverness Drive East, Englewood, Colo. 80112.

Reports Cover Graphics CRTs

PENNSAUKEN, N.J. — Auerbach Publishers, Inc. has expanded its "Business Minicomputer Systems Reports" with an additional section covering the graphics CRT terminal market.

In addition to representing graphics terminals and their manufacturers, the added section presents information about teleprinters, alphanumeric displays, remote batch terminals and intelligent terminals, according to an Auerbach spokesman.

Altogether, the insert covers more than 450 terminal models from more than 150 vendors.

For more information about the reports, contact Auerbach at 6560 N. Park Drive, Pennsauken, N.J. 08109.

Hex Wire Wrap Module Debuts

ORANGE, Calif. — Intended for Digital Equipment Corp. PDP-11 minicomputers, a hex wire wrap module from MDB Systems, Inc. accommodates combinations of up to 96 dual in-line integrated circuits or low-profile sockets, according to an MDB spokesman.

Fifty-five of the W9302's 96 positions are dedicated to 16-pin sockets with prewired power and grounding, while 11 positions accept 20-pin devices with prewired power and grounding. Five columns reportedly provide hole patterns that accommodate 14-, 16-, 22-, 24- or 40-pin circuits, with a maximum of three 40- or five 24-pin circuits accepted per column.

Fifty-five circuit positions use high-frequency ceramic capacitors to provide power and ground decoupling caps. The board also provides pads for decoupling caps, the spokesman said.

Two I/O positions on the W9302 reportedly accepts up to 50 conductor ribbon-edge cable connectors.

The connector position on the module's top edge serves as an I/O cable to external units or provides interconnection between additional modules.

Available 14 days or less after receipt of order, the hex wire wrap board costs $195 and can be ordered from MDB Systems at 1995 N. Batavia St., Orange, Calif. 92665.

Business System Boasts Diagnostic Capabilities

By Jeffry Beeler
CW Staff

LOS ANGELES — Some of the industry's latest reliability features including integrated self-testing and fault-isolation circuits are expected to play key roles in a stand-alone small business system slated for delivery this spring by Rexon Business Machines Corp.

Currently in the breadboard stage, the Multiple-Terminal System (MTS) sports a remote diagnostic capability in which most hardware "bugs" are detected by microprocessors built into the system's printed circuit boards, according to a Rexon spokesman. With this capability, maintenance personnel at remote locations can diagnose hardware ills down to the board level and can often prescribe appropriate remedies without making repeated trips to a customer's site, he explained.

One of the other key user features is the reportedly unusual way the MTS runs application software, but Rexon declined to elaborate on this side of its announcement other than to say that its program packages will be tailored "to do each user's particular application."

For First Time Users

Suited primarily for first-time users, the system will perform standard accounting functions and related services for manufacturers, distributors and other businesses whose annual revenues range between $500,000 and $25 million, the source said.

Rexon, a recently formed small business computer manufacturer whose principals include Wangco, Inc. founder Dr. Ben Wang, described the MTS as a multiprocessor system comparable to the $25,000 to $50,000 members of the Wang Laboratories, Inc. 2200 series. The company also likened the MTS, its first product, to the Basic/Four Corp. Model 200 and 400 and to all the low-end members of Qantel Corp.'s business systems line except the company's smallest offering, the floppy disk-based Model 210.

Rexon cited state-of-the-art hardware features as one of the MTS's chief advantages over rival systems. For example, its CPU is

(Continued on Page 50)

Soviets Using U.S. Systems For Foreign Aid Application

By Marguerite Zientara
CW Staff

TORRANCE, Calif. — Despite the U.S. government policy limiting exports of domestic DP equipment to communist countries, the USSR recently began using 11 American small business computers in its foreign aid program, and Soviet plans call for the eventual delivery of almost 50 additional systems for that and other applications.

The Soviet General Technical Department is using Cado Systems Corp.'s System 20 minicomputer "in its economic support of underdeveloped nations," according to a Cado spokesman, who said more specific information about the application is unavailable.

Cado chairman George Ryan traced the Soviet purchase to a November 1977 computer conference in Moscow where the company's European distributor demonstrated the System 20. Apparently impressed with what they saw, the Soviets contacted the U.S. Commerce Department through their Ministry of Foreign Trade and applied for permission to import 60 of the Cado systems.

On the Soviet side, then, the way seemed clear for the deal's completion. In fact, the Kremlin seldom impedes orders for American computer equipment as long as funds are allocated for its purchase. "They don't have any red tape — the government is everything," Ryan said. "If the government wants to buy something, it buys it. That's all there is to it."

Crucial Obstacle

On the American side, however, a crucial obstacle remained because, to consummate the deal, Cado first had to obtain an export license from the Commerce Department, and, as many hardware vendors have discovered in the past, such licenses are often hard to get.

"Everyone told me we'd never get an export license because no microprocessing system had ever been approved for shipment to

(Continued on Page 48)

Magnetic Tape Subsystems Unveiled for IBM's Series/1

ATLANTA — In the flurry of recent additions to IBM's Series/1 and System/34 small business systems, one enhancement — a family of magnetic tape subsystems for the Series/1 — almost went unnoticed.

Introduced two days after the other Series/1 enhancements, the 4969 subsystem line consists of six models that read and write at 45- or 75 in./sec and that suit applications like data interchange, record storage and journalizing, according to an IBM spokesman.

Four members of the family — the single-density models — record 800- or 1,600 bit/-in. and offer a choice of two recording modes — NRZI and phase-encoded. The other two members — the double-density units — record both 800- and 1,600 bit/in. and provide both the phase-encoded and NRZI recording modes, the spokesman explained.

Designated the 4969/4D and -/7D, the two dual-density models operate at 45 in./sec and 75 in./sec, respectively, and can serve as the primary unit in a tape subsystem incorporating up to three single-density add-on units.

Add-On Units

For the 4D, the add-on units include the 4969/4N and -/4P, both of which match the 4D's 45 in./sec operating speed, the source said. For the 7D, the add-ons include the 4969/7N and -/7P, both of which operate at the same 75 in./sec rate as their dual-density companion.

To form subsystems, users link primary

(Continued on Page 48)

Mini Maker Follows Own Advice: 'Automate'

WELLESLEY, Mass. — After urging prospective users for years to computerize their operations, a minicomputer vendor recently followed its own advice and automated its printed circuit design with two interactive graphics terminals.

Since Prime Computer, Inc. began using the two California Computer Products, Inc. Model 100 terminals, the mini maker has reportedly simplified its printed circuit design and shortened the process from six months to less than six weeks.

Designing a printed circuit board involves many complicated, time-consuming steps including mapping, checking and remapping the more than 350 integrated circuits and 175 capacitors that constitute each board. Because Prime designs and redesigns boards for hundreds of processors and peripherals each year, design speed represents one of the company's main business concerns, according to Roland Mattison, manager of design automation.

With the two graphics terminals, Prime's board designers can selectively preview, inspect, delete and otherwise modify a design and thus eliminate machine- or hand-drawn plots for revision and correction.

When the company began designing boards six years ago, Prime's designers drew each eight-layer board manually, then digitized the routing information and used a computer to check for errors. The drawings were revised by hand and the data was checked by computer before the board was revised again. This process was repeated several times until the board was completed.

"We found this procedure to be slow and expensive. Our designers were laboring endlessly over new drawings and modifications," Mattison said, "and it was very difficult to keep pace with the rapid changes in technology."

First Step

Prime took its first step toward automating board design two years ago when it purchased a Tektronix, Inc. graphics terminal and later leased an automatic placement and routing software program called Sci-Cards from Scientific Calculations, Inc. in New York. "That system enabled us to eliminate the manual drawing of the PC board," Mattison said.

In 1977, Prime conducted a study to find additional terminals, "ones that were faster and capable of accommodating both printed circuit boards and logic diagrams," Mattison added. "The Calcomp terminal seemed to be the best match for those applications, and it was the right price. We also wanted raster scan technology, which allows us to generate and make revisions on the terminal more rapidly, and we liked the selective erase, pan and zoom capabilities of the terminal."

Now, to design a PC board, Prime designers enter board requirements into a computer, which uses this information to establish the initial automatic placement and routing paths.

But because the computer can't finish all the required interconnects, a designer displays the unfinished routing diagrams on the Model 100 and makes the necessary corrections or additions.

Operator revisions appear instantly on the terminal screen and simultaneously become part of the revised data within the computer. If hard copy is required, a plotter connected to the computer draws the finished board diagram on command.

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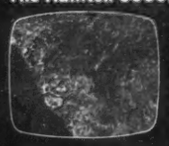

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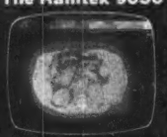

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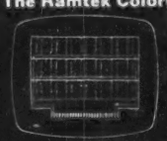

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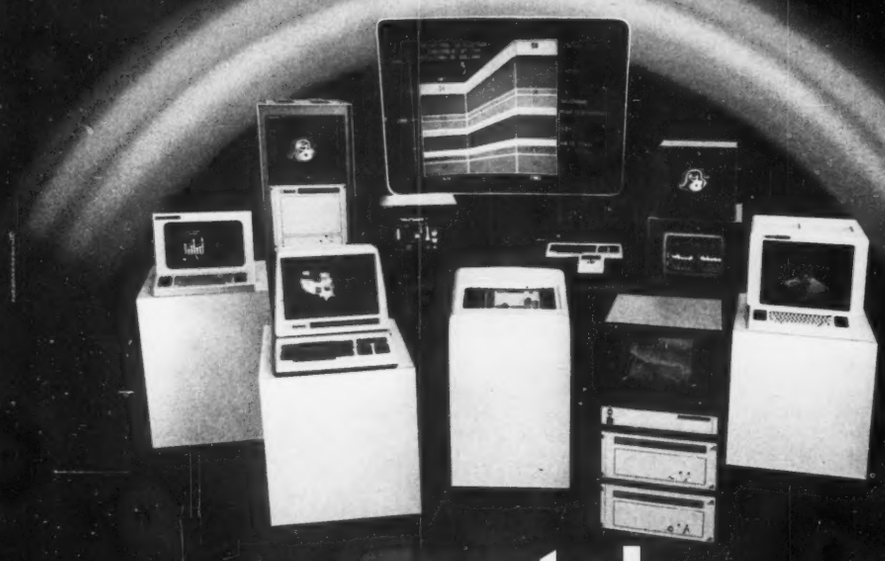

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Monday 5 March

1 Market factors and technological change Ulric Weil, Morgan Stanley

New IBM products, and IBM's marketing strategy, will be determined by what is wanted by users and what is technically and economically feasible. This session examines the changing application requirements of existing and prospective users, evaluates future trends in the costs and performance of current and forthcoming technologies, and diagnoses the economic health of IBM and its competitors in the near future.

2 System 370 and beyond John Bock, Itel

The 303X series is an end-of-life 'kicker' for the 370 architecture; its low purchase-to-lease cost ratio indicates that IBM wants customers to buy rather than lease — and that's always a sign of impending obsolescence. What will the new E and H series look like, and when will they be announced? This session investigates IBM's short and medium term plans for new mainframe announcements, and assesses their impact on users and competitors.

3 Future IBM peripheral systems Peter Bates, Memorex

Peripheral systems account for an increasing proportion of hardware costs. What new storage and I/O devices will IBM introduce, and how will they be packaged in relation to processors hardware and software? This session examines new and established technologies, assesses their future commercial significance, and predicts how they will be incorporated in IBM's new range of peripheral systems.

4 IBM's shifting revenue sources Klaus Haider, Word Processing International

Data Processing Division (DPD) is the heart of IBM, and DPD is intent on rejuvenating the mainframe market. But Office Products and General Systems Divisions (OPD and GSD), which will shortly merge, are into new markets, with new and rich prospects (and new problems, too). This session shows how IBM's center of gravity is slowly shifting, and explores the consequences both for IBM and for the rest of the DP community.

Tuesday 6 March

5 System software — IBM's plans Dick Bayles, National CSS

Two distinct trends are apparent in IBM's software strategy; the first is the extension of unbundling into system software, and the second is the migration of system functions from software into firmware or even hardware. What effect will these trends have on future IBM architectures, and how will they affect suppliers of IBM-compatible software and hardware?

6 IBM's database plans Stephen Robinson, Consultant

Committed to IMS, but with a strong internal faction in favour of the relational approach, it nevertheless seems possible that IBM is about to adopt a database architecture based on the ANSI and CODASYL proposals. Such an architecture could well be implemented using a new 'back-end' database machine. What will IBM's strategy actually be?

7 IBM and the plug-compatible suppliers Bill Easterbrook, Kidder Peabody & Co

Ever since unbundling, IBM has been plagued by fierce competition in narrow areas of its product range. The plug-compatible suppliers of peripherals and mainframes benefit from the standard interfaces developed by IBM; IBM can damage the plug-compatibles by changing those interfaces, but only at a significant cost to itself. IBM also has a powerful battery of economic weapons at its disposal. What are IBM's options, and how will the plug-compatibles respond?

8 IBM and the US Government Herb Grosch, Consultant

The US Government is probably the only organization in the world that has the power to materially affect IBM's plans — as a customer, and as the instrument of regulation and control. Its legal muscle, combined with its massive purchasing power, make it a potentially formidable protagonist in the computing arena. What effect will Government policies and actions have on IBM in the next five years? In terms of standardisation, anti-trust, and communications regulations, IBM's future may hinge on the decisions of politicians.

Wednesday 7 March

9 IBM's plans — networking and data communications
Ronald Sander, Library of Congress

IBM was later than most other manufacturers in recognising the close connection between computing and communications, but there is no doubt that networking and data communictions are now central to IBM's future plans. How will current IBM networking concepts (in particular SNA) be extended or modified in the future, and what new developments can be expected? How will IBM incorporate satellite communications and other new communications technologies into its future product line?

10 IBM and foreign governments Rex Malik, Freelance Journalist

Like many multinationals, IBM is suffering from the recent upsurge of economic nationalism in Europe, Japan, and the Third World. What are the objectives of foreign governments, and what weapons can they use in achieving their ends? Can IBM survive in foreign markets without losing control of its subsidiaries? For many years IBM World Trade has been the most lucrative sector of IBM — the impact of economic nationalism on World Trade's profitability could have severe repercussions on the health of the parent company.

11 IBM — the user's view Edward Farrell, Amax

New IBM products are only one of the existing IBM user's worries. Perhaps more important, over the next five years, are such considerations as support, pricing policy, maintenance, and IBM's general business practices. In this session these and other factors of significance to the IBM user are analysed, and possibly changes in the relationship between IBM and its users are forecast.

12 Forum

An open discussion session at which speakers answer questions from the floor and elaborate on points raised during the Conference, while delegates contribute their own experience and expertise to the discussion.

Sheet Feeders Bow

SANTA ANA, Calif. — Two add-on sheet feeders from BDT-Rothweil Co. provide fresh paper to Diablo Systems, Inc. and Qume Corp. daisywheel printers and then stack printed documents without operator intervention, according to a spokesman for MQI Computer Products, Inc., BDT's exclusive North American distributor.

One of the automatic sheet feeders, the Model 150, reportedly accommodates up to 250 sheets of 20-lb paper. The other feeder, the Model 170, holds a similar amount of two types of paper.

This ability to accept different paper types simultaneously proves important if the first page of a multipage document is printed on different stock from succeeding pages, as often happens with two-page business letters in which the first sheet bears a company letterhead and the second is blank, the source explained.

The models 150 and 170 cost $1,295 and $1,495, respectively, and are available from MQI at 3315 Otis St., Santa Ana, Calif. 92704.

Double-Density Disk Suits LSI-11

NATICK, Mass. — Intended for the Digital Equipment Corp. LSI-11, a double-density floppy disk system from Charles River Data Systems, Inc. incorporates a single-board controller that is said to be both instruction set- and pin-compatible with the DEC RX02 system.

The FD-211's dual-height controller card plugs into any DEC LSI-11 or LSI-11/02 backplane and incorporates features like bootstrap loader, IBM 3740 formatter and interface circuitry, according to a Charles River spokesman.

Mounted in a 5.25-in. high enclosure, the dual floppy disk unit uses Shugart Associates SA800 drives, which operate in both the single- and double-density mode. As a result, the FD-211 is downward-compatible with all single-density media.

The unit reportedly transfers 480K bit/sec, seeks in an average of 203 msec and stores 6,400 bit/in.

With bootstrap loader, the FD-211 costs $3,250 and is available from Charles River Data Systems at 4 Tech Circle, Natick, Mass. 01760.

Series/1 Gains Tape Subsystems

(Continued from Page 45)

and add-ons through three attachment features, which include the Models 1540, 1545 and 1550. The models 1540 and 1550 fit the 4N and 7N, while the models 1545 and 1550 suit the 4P and 7P. The Model 1550 also corresponds to the two dual-density systems, the source reported.

IBM credits the 4N with transferring 36K byte/sec and with recording 800 bit/in. in the NRZI mode, while the 4P transfers 72K byte/sec and stores 1,600 bit/in. in the phase-encoded mode. Depending on which add-on model it supports, the 4D transfers 36K- or 72K byte/sec, records 800- or 1,600 bit/in., and uses either the NRZI or phase-encoded recording mode.

The 4D's recording density is program-selectable to allow the unit to adapt to the appropriate add-on system, the spokesman said.

The 7N, meanwhile, transfers 60K byte/sec and records 800 bit/in. in the NRZI mode, whereas the 7P transfers 120K byte/sec and stores 1,600 bit/in. in the phase-encoded mode. As the primary unit for these two systems, then, the 7D transfers either 60K- or 120K byte/sec, records 800- or 1,600 bit/in. and uses both the NRZI and phase-encoded modes.

Like the 4D, the 7D also provides program-selectable recording densities that allow the unit to adjust to the requirements of the 7N or 7P.

All six 4969 subsystems come with a licensed software support package whose components include device management, data set management, utilities and an on-line tape exercisor, the source explained. The support program costs $1,020 or is available for a $17/mo license fee.

The 4N costs $8,950; the 4P, $9,350; the 4D, $9,950; the 7N, $11,950; the 7P, $12,350; and the 7D, $12,950.

All 4969 products — including the subsystems, licensed programs and attachment features — will become available in December from IBM's General Systems Division, which can be contacted at Box C-1645, Atlanta, Ga. 30301.

Soviets Using U.S. Minis In Foreign Aid Program

(Continued from Page 45)

Russia," Ryan recalled. "But since our System 20 was designed strictly for business applications, I decided to give it a try. Curiously enough, we had no problem getting a license.

"The ones that give the most trouble are the great big computers. Certainly a Cado system isn't going to help them get to the moon, raise a satellite or offer a threat to us in terms of defense — it's not a military kind of product."

The U.S. Commerce Department apparently agreed with Ryan's assessment because last summer Cado was allowed to ship 11 System 20s to the Soviet Union, with the bulk of the order to follow at an unspecified date.

Different Configurations

The System 20s shipped to the Soviets thus far provide several different configurations. "Some of the systems have flexible disk drives, and others have hard disk drives," Ryan said. Some also incorporate multiple CRT terminals, and all include Centronics Data Computer Corp. line printers.

Using virtual memory, the systems accommodate the equivalent of about 200K bytes of main storage, although the hardware vendor does not measure its products' capabilities in those terms, Ryan added.

For the Soviet applications, the System 20s provide 19M bytes of hard disk storage, "but we use file compression techniques that triple the effective use of that space," he said.

Although the Russians have earmarked the first System 20s for their foreign aid program, they plan to use subsequent systems for applications like automatic invoicing, payroll, stock control and statistics. "We have indications that our System 20 will become the standard intelligent terminal for the Russian Riad computing system," Ryan said. He likened the Riad to IBM's 360 series mainframes.

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Mini Helps Hosiery Maker Ride Fashion Tide

HENDERSON, N.C. — While the demise of miniskirts in women's fashions spelled disaster a few years ago for many fledgling hosiery companies, the simultaneous rise of the minicomputer signalled success for one such manufacturer.

During a 10-year decline that saw the number of hosiery plants dwindle from 329 in 1968 to 183 in 1977, Americal Corp. astounded the industry by posting sales and profit increases, Felix McDaniel, Americal's vice-president of finance, claimed.

The firm, now the nation's third largest manufacturer of women's hosiery, sold more than eight million pairs in 1976. McDaniel attributed the firm's success to many factors, including a minicomputer, which reportedly contributed to Americal's sound management and "highly efficient" plant operations.

After acquiring a 32K-byte NCR Corp. Century 100 system in 1972, the company upgraded its hardware in February 1977 to a 128K-byte NCR Corp. Criterion 8550, according to Ronnie Brendle, the firm's DP manager.

"Our Century 100 was being used to full capacity at the time of the upgrade," Brendle said. "Although we didn't need all the capacity of the 8550 immediately, we realized we would need it in the future."

One of Americal's profit and sales secrets is said to be rapid inventory turnover and fast order response time. "We produce to order instead of producing for inventories, and we try to ship all orders within 10 days," he said.

Americal averages 10 to 12 inventory turnovers per year, compared with the industry average of two or three. Without a lot of money tied up in stock, Americal can improve cash flow. "With a small inventory, however, order processing must be very efficient," McDaniel said.

Americal's customer orders are keyed into the central computer through two NCR 7200 data terminals. The company's system incorporates three 100M-byte NCR disk units, which store the customer information needed to generate the production paperwork.

That information includes packaging specifications, addresses for approximately 15,000 ship-to locations and employee piece rates for sewing, boarding and packaging different styles of hosiery, he noted.

Report Production

The computer reports this production information on forms with tear-away tickets for each department. Employees attach these tickets, indicating the number of items in the order and the piece rate, to their individual time sheets, McDaniel said.

At day's end, this information is keyed into memory to produce a daily payroll incentive printout on the company's 1,200 line/min NCR Model 657 printer. "Each employee gets a 'pay ticket' at the beginning of each day, showing the previous day's production and his or her incentive earnings for that day," McDaniel said.

For an overall picture, Americal's production manager receives assorted daily reports to aid in scheduling decisions. A computerized orders-received report details by style, size, color and delivery deadline all orders received the previous day.

Another printout shows total open-order commitments, while production reports indicate information like each department's production capacity.

When orders are shipped, tickets are sent to the accounts receivable department and the information is entered to generate invoices. The computer-prepared invoices leave the same day as the shipment.

In inventory, Americal maintains some files by computer and some manually. A computerized perpetual inventory system is maintained for nylon yarn, the main raw material used at Americal. When yarn shipments are received, computer cards are punched for each yarn case, worth from $350 to $700 each. These tickets, jacketed on the cases, are pulled when the yarn is sent to production and are entered to adjust the inventory.

A perpetual inventory system is also used to maintain an adequate supply of packaging materials, which must be ordered three to four weeks in advance, McDaniel noted.

Americal's six remote production facilities each have an NCR 7200 terminal and three have NCR 6440 matrix printers as well, according to Brendle. Orders are keyed into the Model 7200 terminals, and the data is transmitted to headquarters for processing.

The necessary production paperwork is then transmitted back to the mills for printing. Shipping triggers another data exchange, and invoices are printed at the home office, Brendle said.

Americal plans to upgrade its equipment within the next six months to a 512K- or 1M-byte NCR V-8450 processor and plans to use NCR's VRX operating system.

System Sports Reliability Features

(Continued from Page 45)

built around a 16-bit Intel Corp. 8086 microprocessor, whereas most competitive systems incorporate 8-bit processors, the spokesman explained.

Unlike most of its rivals, the Rexon system uses 16K-bit memory chips and Intel memory refresh chips.

Another main competitive edge of the MTS is said to be its ability to run application software faster than rival systems. Rexon declined, however, to specify the speed differential, which the spokesman said varies too much from application to application to quantify meaningfully.

The source attributed the system's improved application processing speed to its CPU's 16-bit architecture and to an enhanced instruction set, which reportedly includes decimal arithmetic, decimal-pack arithmetic and other features "tailored to business system operation."

Floppy or Cartridge Disks

Rexon plans to offer its small business system either as a floppy disk or as a cartridge disk-based configuration. In either case, the system incorporates a 64K-byte CPU that provides an 800-nsec memory cycle, 200-nsec machine cycle and a random-access main memory that expands in one 64K-byte increment to 128K bytes, the spokesman noted.

In theory, both the floppy disk- and the cartridge disk-based versions also accommodate up to six I/O processors, each of which provides four RS-232 ports for CRT terminals and one parallel port for a printer. In practice, however, the two MTS models support only two I/O processors for a total realistic capacity of eight terminals and two printers.

Users can reportedly configure their systems with a choice of printer options, including 300 line/min Printronix, Inc. units, 150 char./-sec Texas Instruments, Inc. 810s, or either 120 char./sec Centronics Data Computer Corp. 702s or 180 char./sec Centronics 703s.

In addition to supporting terminals and printers, each MTS I/O processor accommodates up to two 1M-byte floppy disk systems or up to two 10M-byte cartridge disk systems. Thus, with a typical maximum of two I/O processors, the system incorporates as much as 4M bytes of floppy disk storage or as much as 40M bytes of cartridge disk storage, the source explained.

Software support for the MTS reportedly includes an as yet unnamed multitasking operating system that supports Business Basic as its only programming language.

A typical floppy disk-based MTS configuration consisting of a 64K-byte CPU, two terminals and a 180 char./sec printer costs $25,000. A typical cartridge disk-based system with a 64K-byte processor, 20M bytes of mass storage, two terminals and a 180 char./sec printer sells for $35,000.

Shipments of both the floppy disk- and cartridge disk-based MTS versions are scheduled to begin in May from Rexon, which, until mid-February, can be reached at 2346 Westwood Blvd., Los Angeles, Calif. 90064. After mid-February, the firm plans to move its manufacturing facilities to the Fox Hills Business Park in Culver City, Calif. 95023.

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HP Graphics Printer Outputs 480 Line/Min

PALO ALTO, Calif. — Hewlett-Packard Co. has turned the integrated printer for its System 45 desktop computer into a stand-alone unit that reportedly outputs 480 line/min across an 80-character line.

Though intended primarily for HP's 9825 and System 35 desktop units, the 9876A also suits other computers, both HP and non-HP, through eight-bit parallel and IEEE-488 interfaces, according to a company spokesman.

Expected applications for the thermal graphics printer reportedly include high-speed listings, frequent working reports and graphics in environments like hospitals, laboratories, business offices, remote terminal locations and other sites requiring low noise emission and unattended operation.

HP credits the 9876A with using a 5 by 7 dot matrix to print a 128 upper and lowercase Ascii character set with a 77 dot/in. resolution. The system provides seven additional software-accessible character sets including French, German, Katakana, British, Spanish, Danish/Norwegian and Swedish/Finnish.

In addition, users can create up to seven characters at a time by defining custom dot patterns that are then stored in the printer's memory, the source explained.

Special Features

Though basically a stand-alone version of the System 45's thermal printer, the 9876A incorporates several user features not available in its integrated counterpart. These features include a separate power supply, built-in precautions that protect the unit's printhead from incorrect power levels and high-temperature protection, the spokesman said.

The thermal graphics printer uses fade-resistant black or blue fanfold paper, 330 pages of which fit in the unit's internal tray.

Among its other features, the printer provides two paper-control switches, one that controls the paper-feed motor and another that automatically advances paper past its perforations to a predefined top margin.

The 9876A costs $3,500 and is available from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Robotics' Desktop Unit Upgraded

HARTFORD, Wis. — A performance upgrade for the General Robotics Corp. MVT/X3 desktop computer has doubled that product's floppy disk storage from 1.3M- to 2.6M bytes.

General Robotics attributes the increased capacity to the use of group-coded record formatting and double-headed, double-density minifloppy disks.

In its enhanced configuration, the MVT/X3 consists of a 60K-byte Digital Equipment Corp. LSI-11/02, triple-drive minifloppy disk units, a keyboard with a numeric keypad, a 12-line by 40-character plasma display panel, a 132-column impact printer that outputs 100 char./sec and DEC's RT-11 operating system.

Hardware options include main memory expandable to 256K bytes, a 20M-byte cartridge disk unit and an additional 4M bytes of floppy disk storage. Software options include Fortran IV, Basic, APL, Dibol and Pascal.

In quantities of 20, the upgraded MVT/X3 costs $9,375 and is available from General Robotics at 57 N. Main St., Hartford, Wis. 53027.

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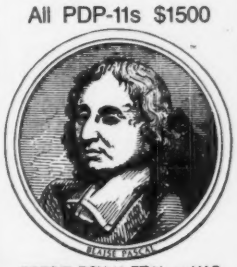

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The SOROC IQ 120 is the result of an industry-wide demand for a capable remote video display terminal which provides a multiple of features at a low affordable price. The IQ 120 terminal is a simple self-contained, operator / computer unit.

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THE NEW SOFTWARE ECONOMICS
PART 3

By Werner L. Frank

IN DEPTH IN DEPTH IN DEPTH IN DEPTH

Werner L. Frank believes software for sale is the best bargain in town. To support that thesis, the executive vice-president of Informatics, Inc. has surveyed the software life cycle, discussed the status of the software products industry, identified successful software products and analyzed the user's attitude toward software products in the context of the whole hardware/software environment.

This week, in the third part of a four-week series, Frank shifts his focus to the software product supplier, developing financial models that contrast the software supplier's economics with those of the hardware manufacturer.

Given the continual need for new software development coupled with the exceedingly large expenditures for hardware in comparison with software, one cannot help wondering whether the buyers' sense of proportion is in order. Hardware is acquired under one set of rules, while software is purchased under another, quite different set, as Figure 1 on In Depth/3 shows.

Consider the product from the point of view of the user. Hardware is purchased as a commodity, whereas software is still considered a specialty item. The impact of this psychology affects the sales cycle as well as the service demands placed on the vendor; it therefore affects the product's cost and its price to the user.

It is much less difficult for a buyer to purchase a commodity than a specialty item since, typically, commodities are offered in a competitive marketplace, where it is much easier to evaluate alternative offerings.

In the case of hardware, the purchaser often does not expect to obtain a discount if he buys multiple units; at the very most, a nominal reduction is available on a well-published sliding scale. On the other hand, users who buy multiple copies of software almost always expect to obtain copies beyond the first at substantially discounted values.

I am reminded of the early days of selling software products to the U.S. government. In the late 1960s, the General Services Administration energetically sought to convince offerers of software products to make them universally available to all elements of the federal government after one copy was acquired.

Maintenance is either built into the hardware lease price or sold separately, but each user understands that it is a necessary cost element when operating a computer. Annual fees for maintenance depend upon the type of device being maintained. They can range as low as 3% of list price for solid-state devices to as high as 20% of the product value for certain electromechanical equipment. Typically, however, for a mixed computer configuration, the maintenance charge has been on the order of 8% per annum.

This maintenance policy of the hardware vendor should be contrasted with that of the software product vendor, which demands no obligation on the part of the user. Some users of software products feel they can get by without maintenance. Others resist the additional fee feeling, perhaps, that they have already paid for the software once.

Nevertheless, software is a complex product needing constant attention and evolution, not only to correct defects in the product itself, but also to provide the changes necessary to keep up with associated hardware and operating systems software.

Maintenance fees charged by software product vendors typically have been in the 5% to 10% range and, at that level, appear to be essentially inadequate to keep the product properly up-to-date and to supply the quality of enhancement expected. Users should remember that their own internal maintenance efforts for existing application software are substantial and, therefore, they should not expect to receive this type of service without being appropriately charged.

The performance of hardware typically is accepted "as is." Users do not have anything to complain about once they have made the device selection. In the case of software, on the other hand, users somehow expect constant improvement in performance as part of the commitment made to the software during the time of initial sale.

Users clearly understand that hardware upgrades imply incremental costs if they wish to stay in pace with additional capacity or features. But the same users often expect software upgrades to be part and parcel of the product itself and, hence, a benefit for which he does not necessarily anticipate making additional payments.

Users are conditioned to expect limited support from hardware vendors once the hardware has been installed and accepted. Even for a fee, support may not be available from the vendor itself.

The same users expect continuous and swift support from their software vendors, often expecting it as part of a bundled arrangement with the original purchase of the software. Now users even expect an around-the-clock, toll-free "hot line" to their software vendors if questions arise in respect to the proprietary software.

At this time hardware users recognize a five- to seven-year life cycle for their devices and appropriately amortize them over such a period. Any time beyond this depreciation period is looked upon as a bonus.

On the other hand, users seem to expect that software should live forever, especially

(Continued on In Depth/3)

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NCR
Complete Computer Systems

(Continued from In Depth/1)

in today's world of ongoing compatible CPUs. In evaluating the price, however, they think of its cost as though the software had a very short life.

Users do not expect to receive from a hardware vendor the logical design of the hardware device, but they do expect to receive source code from their software product vendor, even if that code is proprietary and can do very little for the user. The user is urged to use the software in its delivered form and be limited to customizing only by means of external parameters.

The result of all of these points is a less enlightened view of software compared with hardware. As a consequence, the software vendor faces a difficult marketing and support climate. The impact of these views adversely affects the cost and price structure for software vendors to the detriment of the vendor as well as the user.

The resulting economic issues are the heart of the problem faced by the software product industry in its quest for recognition in the scheme of the overall DP user environment and in terms of its growth potential.

Anatomy of the Vendors

In order to understand the relationship between supplier and user as well as the vendor's problems, it is essential to understand the financial structure and operation of the hardware and software manufacturers. To the user, the most top-down view of vendors is through their financial statements. From this perspective, one can deduce the general health of the industry as well as identify problems and pinpoint differences between various suppliers in terms of their cost elements as a function of sales.

Figure 2 presents data from the recent financial statements of several companies representing three important market sectors: computer manufacturers (IBM and Data General Corp.), data processing services (Automatic Data Processing, Inc. [ADP] and Tymshare, Inc.) and software products (Applied Data Research, Inc. [ADR]).

The table vividly shows the tremendous difference in size between IBM and all other organizations. Because of this, we must always view IBM as a special case when attempting to draw overall observations and conclusions.

It is seen from Figure 2 that a second-tier hardware manufacturer, in this case a minicomputer producer – DG – compares favorably in size to the larger representatives of the computer services industry, notably the processing services sector as represented by ADP.

The figure shows a single representative of the software product industry sector, ADR. Publicly available data concerning this industry is exceedingly sparse because participating companies are mostly privately held. Those which are publicly held provide a variety of services and have not separated their performance by business segments.

HARDWARE/SOFTWARE PERCEPTIONS

PARAMETERS	HARDWARE	SOFTWARE
Product View	Commodity	Specialty
Multiple Sales	No Discount or Very Small	Expected Discount, Steep Drops
Maintenance	Accepted; 8% to 12% of Purchase Price	Not Universal; 5% to 10% of Purchase Price
Performance	Accepted As Is	Constant Request for Improvements
Upgrades	Clearly for Fee	Expected as Part of Product
Support	Limited; for Fee	Expected; Bundled
Life Cycle	Five to Seven Years	Almost 'Forever'
Design Details	Not Requested	Often Demanded

Figure 1

SELECTED FINANCIAL STATEMENTS
(In Millions of Dollars)

	IBM	DATA GENERAL CORP.	AUTOMATIC DATA PROCESSING, INC.	TYMSHARE, INC.	APPLIED DATA RESEARCH, INC.
Revenue	18,100	255	299	101	16.9
Cost of Revenues	6,300	120	160	47	1.8
Selling/G&A	6,100	55	75	33	10.4
Development	1,100	26	9	5	1.6
Profit Before Tax and Interest	4,600	53	55	17	3.0
Net Earnings	2,700	29	27	8	1.6

Figure 2

SELECTED FINANCIAL STATEMENTS
(Components of Revenue in Percentages)

	IBM	DATA GENERAL CORP.	AUTOMATIC DATA PROCESSING, INC.	TYMSHARE, INC.	APPLIED DATA RESEARCH, INC.
REVENUE	100	100	100	100	100
Cost of Revenues	35	47	54	47	11
Selling/G&A	34	22	25	32	61
Development	6	10	3	5	10
Profit Before Tax	25	21	18	16	18
Net Earnings	15	11	9	8	10

Figure 3

More revealing is a recap of this data in Figure 3, where the components of the operating statements are shown as percentages of revenue. Recognizing once again that IBM represents a special case exhibiting extraordinary profitability, we can see that the remaining four companies have respectable earnings which, in fact, cluster in a narrow range.

Note the substantially lower cost of sales as a percent of revenue shown for IBM. This reflects the well-known fact that IBM sustains low manufacturing costs by virtue of its overwhelmingly large production level. This lower unit production cost makes its impact directly on the bottom line.

We contrast IBM with DG, where the cost of sales is 12 points higher but selling and general and administrative (G&A) costs are seemingly lower. This probably reflects the method of distribution pursued by each company. IBM has a more substantial marketing activity since it distributes its products directly, whereas DG resorts to substantial OEM relationships, thereby cascading its marketing leverage.

(Continued on In Depth/6)

The HP 2621: sim

Simple doesn't have to mean unsophisticated. The proof is in our new CRT terminal, the HP 2621.

Before building it, we took a long, hard look at the way you use a simple terminal. Then we took the knowledge gained in more than 10 years designing computer products and applied it to engineering an interactive character-mode CRT terminal from the user's point of view.

The outcome was actually two models. The HP 2621A, which sells for $1450. And the HP 2621P, which has a built-in printer, costs $2550. You obviously want the sharpest display made. So we used the 9x15 character cell you see on every HP CRT terminal, including the top-of-the-line. And, to help you look back at the data you've entered, we provided two full pages of continuously scrolling memory.

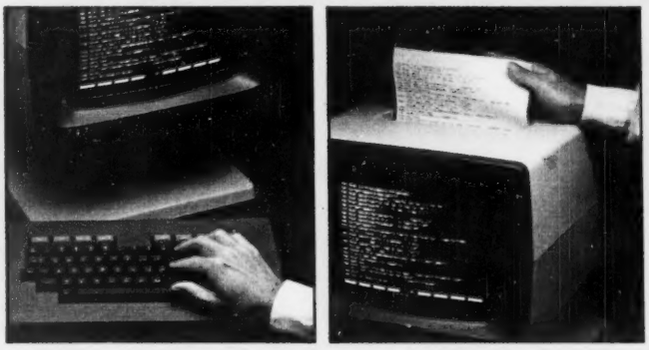
We designed the keyboard like the familiar typewriter, so you don't have to waste time relearning it. We built in eight function keys, too. These control the cursor, rolling and scrolling. And, to make life easier, they're labeled on the screen for self-test, configuration, display and editing.

Editing? On a simple terminal? Certainly. We included character and line insert and delete, clear line and clear display. And, since the 2621 keeps your input separate from your CPU's, you can edit data before sending it to the computer. All without writing a line of system software.

Since flexibility is important in interfacing, we included a user-definable return key that will send your computer whatever code it expects. We also made our terminals compatible with RS232C and Bell 103A, and able to communicate with your CPU at 110 to 9600 baud.

If you need hard copy at your fingertips, take a look at the HP 2621P. With a keystroke, its built-in 120 cps thermal printer will deliver a printout from the screen in seconds.

So why don't you check out the HP 2621 by calling the nearest HP sales office listed in the White Pages. Or send us the coupon. Then see for yourself how sophisticated a simple CRT terminal can be.



Try this on your favorite CRT! With the 2621P, you just hit a key and in seconds you have hard copy of your CRT display. The built-in thermal printer prints upper and lower case at up to 120 cps.

The 2621's bright, high-resolution CRT, with enhanced 9x15 character cell, displays the full 128-character ASCII character set, including upper and lower case, control codes, and character-by-character underline, in 24 80-character lines.

Eight screen-labeled preprogrammed function keys magnify the power of the 2621's keyboard. Preprogrammed functions include editing, terminal configuration, printer control and self-test.

To make numeric data entry faster and easier, we put the 2621's numeric keypad right in the middle of the keyboard. And the 2621's familiar 68-key keyboard is almost as easy to use as a typewriter.

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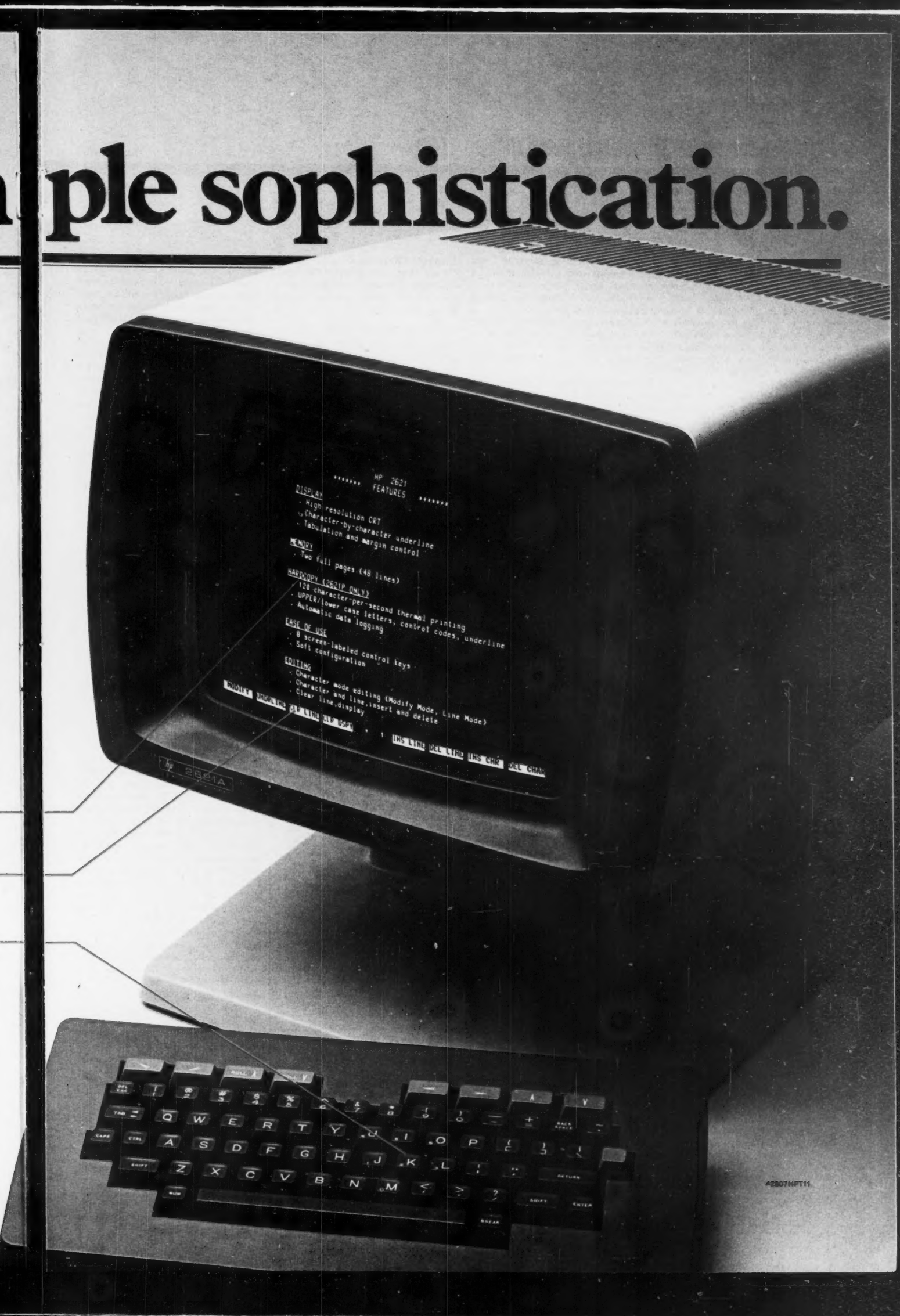


IN DEPTH

(Continued from In Depth/3)

The ADP and Tymshare percentages also reflect the nature of their respective businesses, ADP being more labor-intensive in its operation than Tymshare. It is expected, however, that companies falling into this sector of the industry will, over time, become more comparable in operation as each establishes itself more in the other's primary marketplace.

For example, ADP at first traditionally concentrated on the total computing services function, whereas Tymshare emphasized the remote access and time-sharing portion of the market. Today each of these organizations participates in all markets.

Finally we come to ADR. It is clearly seen that marketing is a much more substantial portion of ADR's total sales dollar than in the other four organizations.

Note the substantial development efforts undertaken by both DG and ADR. With respect to the latter, and in keeping with the emphasis of this article, we recognize the need for software product companies to continually reinvest in their existing products as well as new products.

Higher Margins

In an attempt to compare more specifically hardware and software vendors and further narrow the comparison of companies, Figure 4 shows certain selected business segment information as provided in the financial statements of IBM and ADR. The IBM data is extracted from the most recent Form 10-K (required to be filed periodically with the Securities and Exchange Commission) and shows revenue, profit and asset values for its DP business.

Similarly, we have such data available from the 1977 ADR annual report for its software product business. The ADR data allows us to associate its product development effort exclusively with its product sales and conclude that it is almost 12% of associated revenues.

While the two companies clearly differ in size by two orders of magnitude, thereby highlighting at least one substantial difference in what we can say about hardware vs. software suppliers, it is interesting that IBM's margins on revenue are 50% higher than ADR's, whereas the return-on-assets relationship is just reversed.

However, this last point could be misleading. Software companies are unable to truly represent the asset value of their software. At this point in time, because of accounting convention, internally developed software cannot be treated as a capital asset.

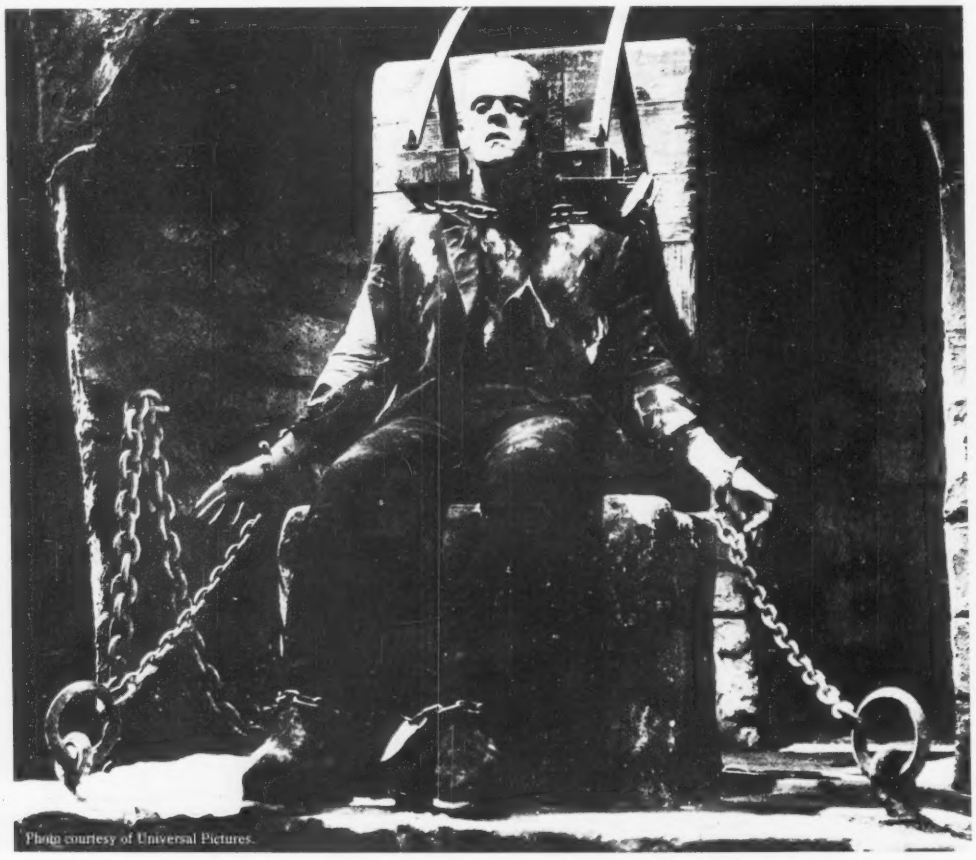
This situation is, of course, a two-edged sword. On one hand, it leads to virtual understatement on the balance sheet which, therefore, can display a better, although misleading, return on investment. At the same time, such understatements limit such companies' ability to grow because they do not give an unfriendly investment community tangible evidence of sufficient values as the basis on which to either make equity investments or provide appropriate debt financing.

But success by IBM in the hardware arena or success by ADR in the software products area does not necessarily speak for the economic health of their respective industries, especially on a continuing basis. It is necessary to look behind the scenes of the products industry in order to fully appreciate the fundamental supplier and user problems. Before this is undertaken, however, hardware and software vendors' operations must be further analyzed so the life cycle parameters and components of cost are understood.

The Hardware Vendor's Structure

In a perceptive analysis of hardware suppliers in his comprehensive treatise, *Data Processing Technology and Economics* (Santa Monica Publishing Co., 1976), Montgomery Phister Jr. carefully studied the life cycle costs and revenues of a theoretical processor with associated system software. He assumed a four-year development period, subsequent manufacturing and the marketing of 1,000 units, shipped during years four through eight. Ongoing maintenance was provided for these systems during years four through 19, the total life span assumed for the hardware.

Phister also included a "sustaining" cost which encompassed both hardware and software expenditures associated with continued product im-



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CalComp's mini-peripheral sales reps won't ever tie you down to outdated equipment.

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On the other hand—and like over two-thirds of all DEC and DG-users—you can try digging up some better performing peripherals on your own.

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So call Roy Davies at (714) 821-2011 and find out why you shouldn't be caught dead with anything less than the best.

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CalComp mini-peripherals: Because who knows what evil lurks?

provement and evolution. This sustaining cost was incurred in years four through 10.

Careful attention was given to detail in building the model, including prorating the hardware and software development, as well as the sustaining costs, over a family line consisting of five independent products. Several cases of revenue generation were given, including assumptions of all units sold, all units leased and a combination of these two modes of sale wherein 30% were assumed sold and 70% leased.

Figure 5 pictorially presents the various revenue and cost items, showing their relevant period of applicability in the 19-year life cycle of the product.

Based on the cost and revenue assumptions developed in Phister's study, two major results were presented with respect to the cumulative profit and loss picture for the enterprise. The results are shown in Figure 6 for two cases: (1) where all systems were sold and (2) where 30% were sold and 70% leased.

Phister went on to recognize the time value of money. Since the life cycle is such a long period, there is a need to normalize the cash flows to present values. This is shown in Figure 6 for the second case, assuming a 10% interest rate.

The Phister data is surprising. The gross profit associated with the sale of a processor seemingly ranges between 53% and 69% of revenues, depending upon which model is viewed. This profit amount does not correspond to experience and therefore is suspect.

Personal communications with Phister indicated that costs had not been included in the figures so that perhaps one is entitled to reduce the gross profit by another 10 points, which at 43% to 59% still appears high.

Figure 7 (see In Depth/10) compares Phister's current value computations with the empirical data of Figure 3. There seems to be a substantial discrepancy in the number of points in total expenses. It appears that Phister's model has taken the best of the manufacturing situation (e.g., IBM) and the best of the marketing assumptions (e.g., DG), thus constructing a respectable but unachievable theoretical model.

There may be another explanation. The theoretical model reflects a successful CPU product which passes through the normal life cycle of birth and, ultimately, death. Perhaps a CPU which is a winner can generate close to 50% gross profits.

However, every company must sustain losers and carry-alongs besides winners. Furthermore, most hardware manufacturers also make products other than CPUs which have less leverage. And, of course, data from financial reports reflects real life.

Hence, if a company is to achieve, say, 20% gross profit, it must have some products achieving a higher margin in the presence of some activities that may be losing money or that may represent investments for growth.

Based on the foregoing, then, we come up with a representative model reflecting the hardware manufacturer cost distribution while retaining the definitions of Phister:

REVENUE	100%
Development	7%
Manufacturing	25%
Maintenance	14%
Sustaining	1%
Marketing	20%
Total Cost	67%
G&A	10%
Gross Profit	23%

We next emphasize what Phister also found to be rather significant, the high cost of maintenance. The maintenance

(Continued on In Depth/10)

SELECTED BUSINESS SEGMENT INFORMATION

	IBM	APPLIED DATA RESEARCH, INC.
	(Billions of Dollars)	(Millions of Dollars)
Revenue	14.8	13.8
Margin*	4.4	2.6
Associated Assets	11.0	4.0
Margin on Revenue	30%	19%
Return on Assets	40%	65%

* Margin is approximated by allocating corporate expenses and excluding nonoperating income.

Figure 4

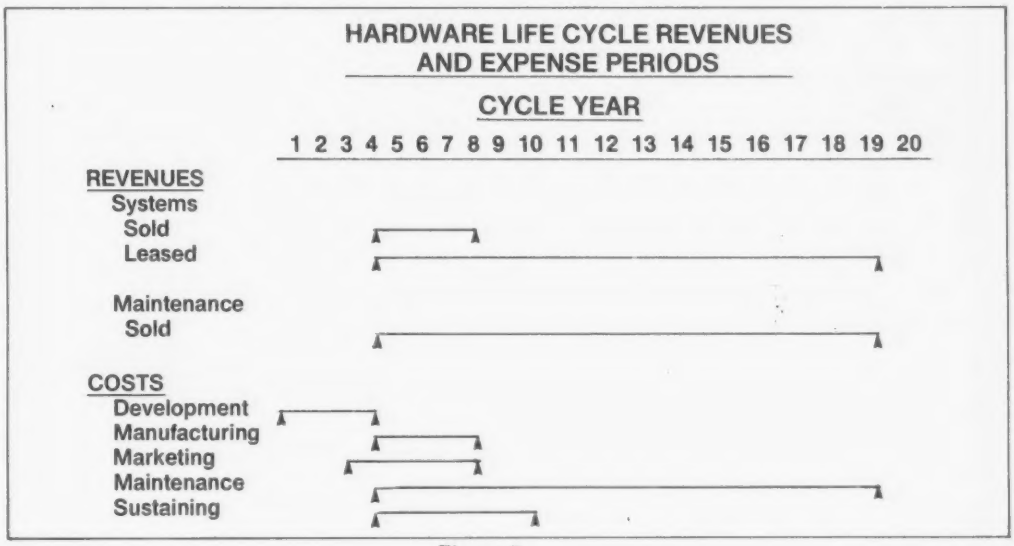

Figure 5

SUMMARY LIFE CYCLE PROFIT/LOSS (In Percentages)

	ALL SOLD	30% SOLD/70% LEASED CURRENT VALUE	30% SOLD/70% LEASED PRESENT VALUE
REVENUE			
Systems	83.3	96.7	96.9
Maintenance	16.7	3.3	3.1
Total	100.0	100.0	100.0
COSTS			
Development	5.1	3.4	6.2
Manufacturing	16.7	11.1	15.0
Marketing	12.5	8.3	12.5
Maintenance	12.1	8.0	7.5
Sustaining	.8	.5	.7
Total	47.2	31.3	41.9
GROSS PROFIT	52.8	68.7	58.1

Figure 6

"TSO

Over 140 installations world-wide use TSO/MON to control TSO and they are *talking*. We believe every TSO shop should have our software product. But don't take our word, listen to what our users are *saying:*

"It is the only software tool designed to specifically monitor and report on the activity of TSO."

Manager of Technical Support

"The use of TSO/MON enabled us to defer adding an additional 158 for 13 months."

Director of Planning

"The only tool available to provide information on TSO user command usage, including SPF activity."

Systems Programmer

"TSO was out of control. It happened so fast. TSO/MON provides the information necessary to track and control the TSO workload."

Manager of Computer Performance

"We wanted to establish control over TSO usage from the beginning and we did with TSO/MON."

Manager of Time Sharing Services

"TSO/MON was used as the sole reporting system in our benchmark study to compare TSO performance across MVT, SVS, and MVS on an IBM 168 versus an Amdahl V6."

Manager of Systems

"Invaluable for assessing the impact of a system change on TSO response."

Systems Programmer

TALK''

"We measure, track, and evaluate programmer productivity under TSO."

Manager of Systems

"New applications were killing performance and we needed a way to monitor and identify these problem systems."

Manager of Technical Services

"The management reports make it easy to assess the status of TSO, how it has changed, and where it is heading."

Director Information Services

"Security uses the product for their TSO audit trail."

Systems Analyst

"The historical data base maintained by TSO/MON enables us to conduct capacity planning studies at the TSO user level."

Manager of Capacity Planning

"The only way to consistently know who is on TSO and what they are doing."

TSO Administrator

"TSO/MON is the best software product that we have ever installed."

Director of Systems Planning

If you want to control TSO you should learn why so many organizations world-wide are *talking about TSO/MON.*

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IN DEPTH

	IBM	DATA GENERAL	PHISTER DATA 30%/70% MIX	PHISTER DATA ALL SOLD
COST OF SALE				
Manufacturing			11.1	16.7
Maintenance			8.0	12.1
Subtotal	35	47	19.1	28.8
MARKETING/G&A				
Marketing			8.3	12.5
G&A			10.0	10.0
Subtotal	34	22	18.3	22.5
R&D				
Development			3.4	5.1
Sustaining			.5	.8
Subtotal	6	10	3.9	5.9
TOTAL EXPENSES	75	79	41.3	57.2

Figure 7

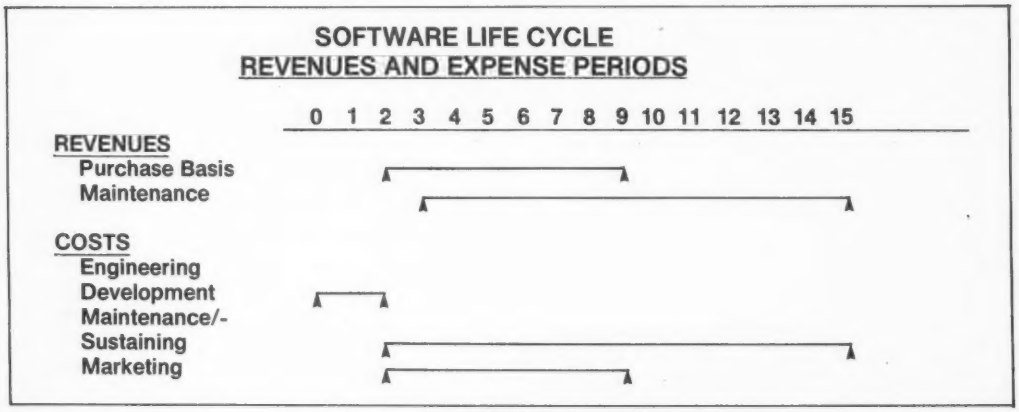

Figure 8

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(Continued from In Depth/7)

cost (of the processor only) over the life of the processor ranges between 7.5% and 12.1% of revenues, depending upon the Phister model and valuation. Of even more significance is the maintenance cost as a percent of total expenses — between 18% and 25%.

Phister concluded, from his analysis of the processor only, that for a total system including the higher maintenance cost of peripheral devices, one could expect to find systems maintenance costs running at 10% to 15% of revenues.

Importance of Maintenance

Another surprising element is the magnitude of the revenues achieved by the manufacturer from maintenance itself. Since leasing of hardware bundles the maintenance, we refer only to the "all sold" model shown in Figure 6, where almost 17% of the total revenues are identified as coming from maintenance.

The importance of maintenance was recognized by Alltech Publishing Co. in a user community survey. A June 12, 1978 *Computerworld* article reported that the users surveyed spent .2% to 31.5% of their annual DP budget on maintenance.

The most revealing conclusion of the Alltech study was users' lack of knowledge of what they were truly paying for maintenance. This is attributable to the fact that maintenance is not explicitly identifiable since it is so often bundled in the various hardware financing alternatives, especially the on-going monthly rental plans.

Industry experts have, from time to time, estimated that users' hardware maintenance costs run from approximately 1% per month of the initial product value to 3% to 5% annually for CPUs and more than 12% for the electromechanical peripheral devices.

Accordingly, it is often concluded that a user's annual maintenance costs, as a function of the total hardware configuration's purchase value, run in the range of 8% to 12%. Typically, these maintenance rates are for a one-shift operation, meaning a nine-hour day, five-day week. They also include parts. For a more extensive round-the-clock, seven-days-a-week support, the so-called "24/7 plan," the amount could be almost double.

The Software Vendor's Structure

A model for the software product vendor's structure can be developed in much the same way that Phister developed the life cycle model for the hardware manufacturer, drawing upon the various observations already made in the earlier parts of this paper as well as personal experience and discussions with knowledgeable executives in the industry.

The model is based on the overall assumption of a 15-year software product life cycle with its associated revenues and expense periods. We assume an initial two-year development activity, followed by a seven-year market-

(Continued on In Depth/12)

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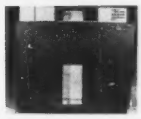

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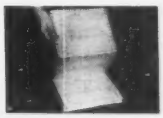

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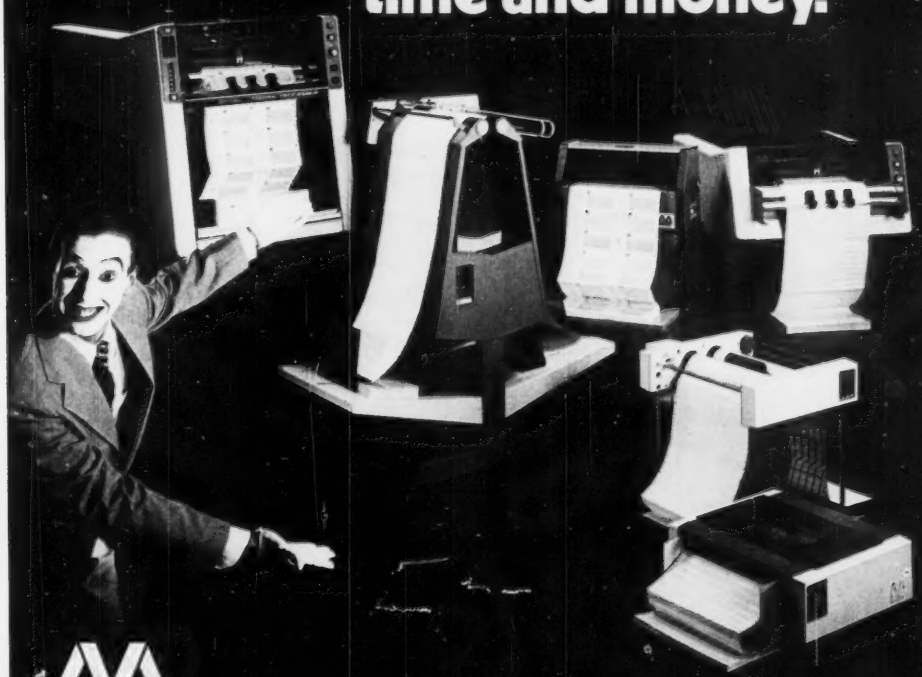

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- ☐ 6. Forms Handling Equipment.
- ☐ 7. Please have my local Moore Representative call me for an appointment.

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IN DEPTH

(Continued from In Depth/10)

ing effort and 13 years of software maintenance operation during years three through 15. This span is diagrammed in Figure 8 (see In Depth/10).

The software is merchandised on an all-sold basis, ignoring the possibility of leasing. This is not an unreasonable assumption, since most software is sold on a front-end license basis or according to monthly payments for a fixed period.

For example, in a software sellers' survey conducted by International Computer Programs, Inc. (ICP), 43% of the respondents indicated their software is made available on a single payment basis, whereas only 7% indicated said they offer their products just for rent. The remaining sample of the survey apparently provides either alternative.

Furthermore, 62% of the respondents indicated that fewer than 5% of current contracts were rental as opposed to single payment. Finally, nearly all software leases were either cancelled or converted to purchase.

A standard industry practice with respect to maintenance is to offer a warranty period for the first year as part of the one-time product payment. Subsequent maintenance is typically available under a yearly contract, which generates revenues that begin one year after the first sales are made and continue through the remaining period of the life cycle.

Costs are identified according to the scheme already shown in the prior section, including development, maintenance, sustaining effort and marketing. The first three elements are collectively called "engineering."

With software, we are unable, as Phister did with hardware, to separately identify a sustaining effort. Hence, it is included in the definition of maintenance. It is known that certain postdevelopment activities take place which could be called sustaining, but are typically wrapped up in the maintenance effort.

Left out of this model are activities that might be termed enhancements of the product. Such efforts must be separately justified on a profit-and-loss basis and have their own independent life cycle model. In other words, the base product, as shown in its 15-year life cycle of Figure 8, must stand on its own, as each enhancement would be required to support itself.

In this sense we differ in approach from the hardware scheme developed by Phister. We do not apportion any of the basic costs of the main product (e.g., development) to enhancements or optional features. For this reason, such additional capability can have substantial leverage, not having absorbed any of the costs which were incurred in developing the central product.

Accordingly, special features or optional capability offered by the vendor on a separately priced basis can be much more profitable (on a marginal basis) than the base product itself.

We next make assumptions concerning our idealized product. As noted from Figure 8, the product involves a two-year development cycle. We assume that the cost of this development, on a fully burdened basis, is $750,000 — representing some 15 man-years of development, together with its associated use of computer time.

We further assume certain basic marketing parameters. Our product will be sold for an average of $30,000 per installation. This average price gives consideration to the fact that customer revenue will include the following price components:

- Base product.
- Educational services.
- Special supplies.
- Multisite discounts.

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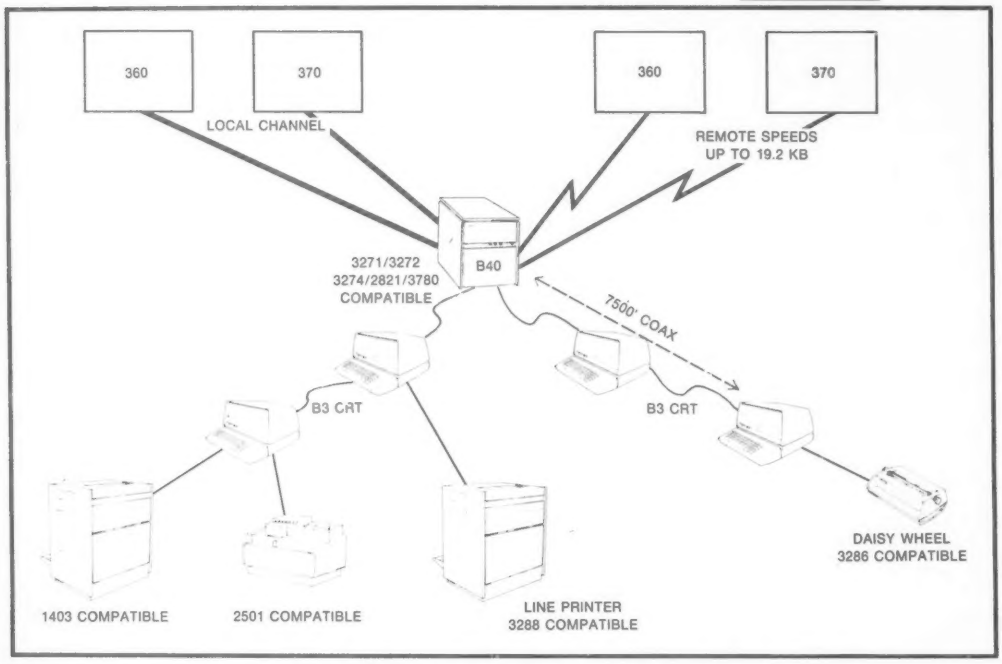

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We again take note of the earlier mentioned fact that optional features are not included in this analysis and maintenance is separately priced.

The product price of $30,000 is reasonable and in line with the already cited ICP survey results, showing that 41% of the vendor respondents offered products whose prices were less than $10,000; 66% less than $25,000; and 85% less than $50,000.

'Quota Salesperson'

A very key assumption is the expected sales level generated by an experienced salesperson. Often this is characterized in terms of stating the sales objectives as a "quota salesperson."

There is remarkable agreement in the software products industry regarding quota levels for sales personnel. This number typically ranges between $250,000 and $350,000 per annum. We assume herein $300,000 for the purposes of this investigation. This, then, leads to essentially 10 sales per quota salesperson per year.

The sales for the model are depicted in Figure 9 (on In Depth/14), where the number of units sold, the associated product value revenue and maintenance revenue are shown for years three through 15 of the product cycle.

Sales in this case will also be recorded revenue, since we make the basic assumption that, at least for the purposes of this analysis, all products will be sold for a one-time purchase price.

The maintenance revenue assumes that the first year of support is bundled into the initial price of the product and that in subsequent years 10% of the prior year's maintenance subscriber base is lost.

The maintenance charge is assumed to be 8% of the product value per annum, or $2,400. This amount is realistic, based on the ICP survey of vendors; the survey found 18% of the respondents have maintenance fees in the range of 0% to 4%; 15% in the 5% to 8% range; 31% in the range of 9% to 12%; and 7% indicated an annual maintenance charge of more than 12%. The composite average was 6.9%.

Finally, Figure 9 shows the number of quota salespersons needed to produce the indicated revenue during years three through nine of the product cycle. We observe that 65 quota salesperson years are needed over a seven-year sales activity to generate the indicated $19.5 million revenue.

Since the quota salesperson is the basis upon which we expect to build our cost model, two additional factors must be incorporated to provide realism. Quota salespersons require initial training, during which time they are not necessarily producing sales, and turnover among sales personnel is substantial.

We, therefore, make an adjustment to the indicated quota person years by 25%, thereby calling for 81 quota salesperson years during the seven-year sales period.

Now we turn to the life cycle cost model. The elements of cost are attributable to the engineering and marketing efforts that comprise the following components:

ENGINEERING
Management
Development
Quality Assurance
Maintenance
Product Support
Administration

MARKETING
Management
Planning
Promotion
Salespersons
Sales Support
Sales Support
Trainers
Administration

The total manpower requirements to support the product for the 15-year life cycle are estimated at 100 man-years of engineering and 275 man-years of marketing and sales support. Assuming that the annual cost per person in these two activities is $40,000 and $50,000 respectively, and assuming a G&A rate of 10%, the statement of operation for the products can be derived as shown in Figure 10 (on In Depth/14).

This composite profit-and-loss statement for the 15-year period shows a 30% gross profit on revenues. This is

(Continued on In Depth/14)

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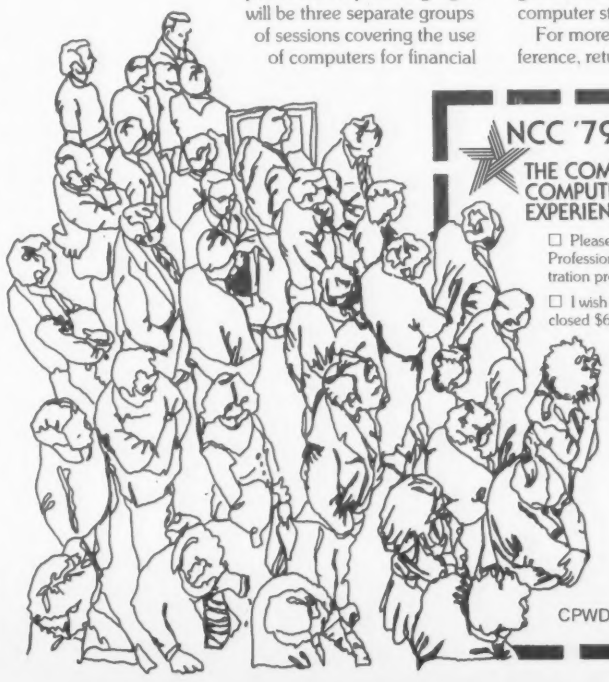

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SALES/REVENUE SUMMARY

	CYCLE YEAR													
	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
Number of Units Sold	50	80	120	150	120	80	50							650
Product Value Revenue (In Millions of Dollars)	1.5	2.4	3.6	4.5	3.6	2.4	1.5							19.5
Maintenance Revenue (In Millions of Dollars)		.1	.3	.5	.8	1.0	1.0	1.0	.9	.8	.8	.7	.6	8.5
Total Revenue (In Millions of Dollars)	1.5	2.5	3.9	5.0	4.4	3.4	2.5	1.0	.9	.8	.8	.7	.6	28.0
Number of Quota Salespersons	5	8	12	15	12	8	5							

Figure 9

(Continued from In Depth/13)

(coincidentally) equal to the maintenance fees. While this relationship is noncausal, it does underline the significance of the maintenance revenues, as we shall see subsequently. From this cash flow, and ignoring other investment capital needs, the internal rate of return is calculated to be 29%.

Detailed Analysis

A more detailed analysis of year-by-year performance is shown in Figure 11. All of the calculations are done and shown in current dollars, not taking into account inflation or the cost of money.

Since software is such a labor-intensive activity, the correction for inflation can be directly embedded in pricing, and therefore the overall structure as given in this analysis does not alter from the point of view of the percentages.

Moreover, the statement of operations (if we assume a 60-day collection period on receivables) is substantially close to cash flow so that Figure 11 can be the basis of a return-on-investment calculation.

Additionally, we take note of the following:

- The first three years of the 15-year product cycle operates at a loss (a $2.7 million risk before positive cash flow).
- The payback point occurs between years five and six.
- The yearly statement of operations displays erratic behavior, fluctuating from a significant negative position to a positive peak of $2.2 million and then trailing off — a swing of $3.4 million.

The latter point, of course, exhibits the frustration of software product vendors which, at this time, are limited by a Financial Accounting Standards

(Continued on In Depth/16)

PROFIT/LOSS PRODUCT CYCLE RECAP

	Millions of Dollars	Percentages
REVENUES		
Product Sales	19.5	70.0
Maintenance	8.5	30.0
Total	28.0	100.0
EXPENSES		
Engineering	4.0	14.0
Marketing	13.7	49.0
Total	17.7	63.0
G&A (10%)	1.8	6.3
Gross Profit	8.5	30.7

Figure 10

PRODUCT LIFE CYCLE FINANCIAL PERFORMANCE (Millions of Dollars)

	CYCLE YEAR														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Yearly Revenue			1.5	2.5	3.9	5.0	4.4	3.4	2.5	1.0	.9	.8	.8	.7	.6
Cumulative Revenue			1.5	4.0	7.9	12.9	17.3	20.7	23.2	24.2	25.1	25.9	26.7	27.4	28.0
Yearly Cost	.6	1.2	2.1	2.4	2.8	2.8	2.7	2.0	1.4	.3	.3	.3	.2	.2	.2
Cumulative Cost	.6	1.8	3.9	6.3	9.1	11.9	14.6	16.6	18.0	18.3	18.6	18.9	19.1	19.3	19.5
Yearly Profit/-Cash Flow	(.6)	(1.2)	(.6)	.1	1.1	2.2	1.7	1.4	1.1	.7	.6	.5	.6	.5	.4
Cumulative Return	(.6)	(1.8)	(2.4)	(2.3)	(1.2)	1.0	2.7	4.1	5.2	5.9	6.5	7.0	7.6	8.1	8.5

Figure 11

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IN DEPTH

PRODUCT LIFE CYCLE FINANCIAL PERFORMANCE
Capitalized Model
(Millions of Dollars)

	CYCLE YEARS														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Revenue			1.5	2.5	3.9	5.0	4.4	3.4	2.5	1.0	.9	.8	.8	.7	.6
Cost Net of Amortization			2.2	2.6	3.1	3.3	3.1	2.3	1.4	.3	.3	.3	.2	.2	.2
Gross Profit			(.7)	(.1)	.8	1.7	1.3	1.1	1.1	.7	.6	.5	.6	.5	.4

Figure 12

(Continued from In Depth/14)

Board ruling that prevents the capitalization of software development and its amortization over the period of related revenues.

We restate Figure 11 in Figure 12, where we capitalize $1.8 million of development and marketing start-up and write-off the investment at $3,000 per unit sold for the first 600 product sales. The erratic effect of the earlier model is dampened, and the swing on the bottom line is reduced by $1 million.

We reach the following conclusions:

(1) The idealized product under consideration here provides a good profit margin at 30%.

(2) This gross profit rate is very dependent upon the unit price, maintenance fee and salesperson productivity rate.

(3) The internal rate of return at 29% and payback over five years is a very respectable and acceptable indication of a good — but certainly risky — investment.

(4) The cash flow requirements for a product are significant, necessitating an amount which may range between 10% and 12% of the total expected product value revenues and between two and three times the initial development cost.

(5) The opportunity to properly capitalize the development cost leads to a more realistic display of performance which, if appropriately phased with other product cycles, can result in a steady picture of company growth and profit performance.

Needless to say, we have shown here the profile of a product life cycle with very satisfactory financial parameters. Not all efforts by an organization, however, necessarily lead to success in every way. Hence, the composite situation, measuring a number of ongoing product activities, will not be as acceptable.

Based on a number of different organizations' experience, the composite model of the software product firm is as follows:

REVENUE	100%
EXPENSES	
Engineering	
Development	10%
Maintenance	10%
Marketing	50%
G&A	10%
Total Costs	80%
GROSS PROFIT	20%

where development includes all ongoing enhancements and new product innovations and maintenance supports existing products.

The programming maintenance function, in the case of software, is substantially more encompassing than the physical maintenance function associated with hardware. We have already seen the tremendous effort users put forth in software maintenance: 40% to 60% of the total programming staff could well be occupied with this task.

Some observers have indicated, as Phister did, that "the number of programmers assigned to maintenance on a permanent basis often exceeds the number originally assigned to develop programs."

There are many reasons why this effort is ongoing as well as difficult. The ongoing aspect relates to the continual need for upgrades, new features, improvements and corrections of defects. Not only does the application environment change, but so does the hardware and associated operating system of that environment.

It should not be a surprise to learn that software companies have notoriously underpriced maintenance when charging 5% to 8% of product value. In the long run, this can only hurt the user.

The maintenance effort is, as many assert, three to five times as costly as the original development costs. Surely a user should be willing to pay 15% of product value per annum for such maintenance, an amount which, over a five-year period, would be no more than the original price of the product itself.

Werner L. Frank is executive vice-president and a director of Informatics, Inc. The firm is a supplier of software, professional services and information processing services.

Frank is a co-founder of Informatics and has been active in the management of the company for the past 17 years. During that time he also was president of Equimatics, Inc., a joint venture of Informatics and The Equitable Life Assurance Society of the U.S.

Frank has a B.S. in mathematics from Illinois Institute of Technology and an M.S. from the University of Illinois.

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Takes Edge Off Billing Pains

Micro Lets Anesthesiologists Rest Easy

By Ann Dooley
CW Staff

WICHITA FALLS, Texas — Two anesthesiologists here used to blame their time-sharing service's computer whenever patients complained about billing errors. But now, a year after switching to an in-house microcomputer, the partners rarely hear such complaints.

According to Dr. James McKinney, partner in the Wichita Anesthesia Group, "We used to turn over all the billing information to the service and it did all the processing. We really didn't like the arrangement because when errors occurred — and they did — the patients would call and all we could tell them was that it was the computer's fault. That answer satisfies no one."

The microcomputer "explosion" made an in-house system affordable so "we decided it was time to take control ourselves," he recalled.

After looking at several systems, McKinney and his partner selected the Medical Billing and Claims Service (Medbacs), partly on the recommendation of a colleague and partly because of price and performance.

Based on Mits

Medbacs, specifically designed for medical recordkeeping, is based on a Mits microcomputer system manufactured and marketed by Pertec Computer Corp.'s Microsystem Division in Chatsworth, Calif. The system, applications programming and service were provided by the system's developer, the Altair Computer Center of Dallas.

"We liked the Mits equipment best, not only for what it could do for us, but for its price," McKinney said. The partners had been paying $500 a month for the computer service. The microcomputer system cost them approximately $13,000, which means they'll "be home free in two years."

They found the system so easy to use that no additional help was needed to run it. The two employees who had previously been processing the paperwork took over "with very little training," according to the Wichita Falls anesthesiologist.

The Anesthesia Group uses Medbacs to print insurance claims forms and aged accounts receivables and also to keep track of the doctors who perform surgical procedures, to drop paid-up patients, to turn over unpaid bills to a collection agency and to incorporate new patients into the system, he said.

The programs were modified where necessary to accommodate the differences between an anesthesiology service and a medical practice, McKinney noted.

The partners also use the system to prepare multiple copies of form letters which look like personal letters and to keep track of bookkeeping procedures. Other applications the two are thinking of developing include a program to interpret blood gases and spirometry. That kind of thing isn't new but now can be developed right in the office, using the micro system, McKinney said.

Medbacs uses a Basic programming language so that anyone can operate the system once the ground rules are learned, according to McKinney. If a person can read and type, he can run it in a week, he added. "You simply tell the computer what you want to do — in very simple language — and it will ask you the questions that will get you where you want to go." It guides the user and provides very simple procedures to correct errors, he said. The system itself includes a Mits CPU with 64K of memory, a dual floppy disk drive, printer, CRT and disk-extended Basic programs.

Not Quite Perfect

The system is not perfect, however. A number of programming and hardware errors occurred in the beginning that needed to be worked out, McKinney said. Further, because the office in which the machine is kept is small, static electricity often causes the system to go down.

Since the Altair Computer Center is in Dallas, programming errors must be fixed over the phone by the employees themselves and if any parts are needed, the service center ships the parts to the medical office, where the machine is repaired by the system operators.

McKinney also noted that if an office has a heavy case load, it would probably need a hard disk system rather than the floppy disk system in use here.

The Anesthesia Group has a patient case load of 600 a month and 2,000 active clients in all. The group runs more than 10 floppies filled with patient data and McKinney advises that 2,600 is about the cut-off number for operating an efficient system on the floppy disks.

As it is, there is more information to put on the system than can be entered during an eight-hour day. In order to keep the cycle going, some of the work must be done manually while other information is being processed on the system.

But both the anesthesiologists and their patients are happy with the system, overall. Fewer mistakes are made and the turnaround time is much faster than before. Patients who come in the office are amazed that such a small machine can do so much, McKinney said.

Micromation Unwraps Controller, I/O Board for S-100 Bus Systems

SAN FRANCISCO — Micromation, Inc. has unveiled two products: an S-100 bus-compatible I/O board and a double-density floppy disk controller for S-100 bus computers that increases floppy disk system capacity to more than 500K bytes per side of standard 8-in. diskette.

The controller — named Doubler — also increases the data transfer rate of double-density systems to 250k bit/sec. The unit was designed for installation in any 8080 or Z-80 S-100 system operating at 2- to 4 MHz, the firm said.

The Doubler's all-digital design is implemented with standard TTL logic so availability is not dependent on LSI circuitry. Data is transferred under program control to assure reliable operation, the firm said.

An on-board 2708 erasable programmable read-only memory (Eprom) contains the bootstrap. A hardware Uart with RS-232 interface for communication with a console device is also included on the board.

The controller was designed to interface with the CP/M operating system and the Doubler includes all software necessary to support a CP/M system using the board's serial port as the console device. No software or hardware changes are needed, the firm claimed.

I/O Board

The I/O board includes a 24-line by 80-character video driver, 24 programmable parallel I/O lines, 24 dedicated output lines with bus driving outputs, a Uart with RS-232 interface and 1K byte of Eprom.

The video driver provides all functions necessary to interface a standard video monitor to an S-100 system. Cursor position and reverse video are controlled in software, enabling the system to create specialized screen formats. Both composite video and TTL levels are provided to interface with all popular CRT monitors, the firm noted.

A keyboard or parallel printer may also be supported by the board, using the 24 programmable I/O lines. These lines are interfaced with an 8255 programmable peripheral interface.

The Doubler, which is available in most single- or double-headed floppy disk drive versions and full and mini-floppy size, costs $495. The I/O board costs $395. Both are available from dealers or from Micromation at 524 Union St., San Francisco, Calif. 94133.

Ecosoft Packages Given Speedier File Structure

INDIANAPOLIS — Ecosoft has introduced a file structure called Skip-Sequential that is compatible with any microcomputer using North Star Computer's disk operating system and Basic, the firm said.

The file structure eliminates the sequential-file requirement of reading through the file before performing a write operation to the disk. The improved speed is accomplished without having to resort to fixed-file records associated with random-access files, and this improves speed on all disk writes while conserving disk space, the firm said.

The file structure has been incorporated into Ecosoft's 70K General Ledger accounting package and provides a data file saving of almost 20%, according to the firm. The package is divided into 16 subprograms so that hardware requirements are reduced to 11K of memory, one or more disk drives and an optional printer.

Each software package includes a program diskette. Prices range from $79.95 for the new General Ledger package to $500 for the firm's multiuser accounting package for certified public accountants.

All the software packages are available from Ecosoft, P.O. Box 68602, Indianapolis, Ind. 46268.

Future Fair Coming Up

PORTLAND, Ore. — More than 250 electronics and DP vendors are expected to exhibit at the first annual Future Fair, to be held here Feb. 1-3 at the Memorial Coliseum.

Tektronix, Inc., Computer Center, Byte Shops and Pacific Northwest Electronics are among those that have reserved display space. In addition to showing off the latest in office and industrial processing, the fair will focus especially on mini- and microcomputer uses for small business and will offer exhibits and seminars for the hobbyist.

In Kit or Assembled

System Built Around 6800

LOS ANGELES — Microdasys has introduced its System 1, which features the firm's custom console, keyboard, S-100 bus motherboard, 16 A power supply, fan, 64 by 16 upper and lower case video/graphics card and the MD-690A CPU board.

The MD-690A combines the 6800 processor with the S-100 board and includes a 2,400 bit/sec cassette interface, 10K of programmable read-only memory (Prom) space, 1K of random-access memory (RAM), 20 I/O bits, an RS-232 interface and interrupt-driven keyboard input. The user can put 8K Basic in on-card Prom and perform multitasking or time-sharing.

The 1K Prom monitor (Monbug) at the heart of the system is compatible with the standard 6800 read-only memory (ROM) so that almost all 6800 software can be used, according to the firm. The MD-690A is also upward-compatible with the third-generation Motorola Semiconductor Products, Inc. 6809 processor chip.

The Microdasys System 2 adds a 32K RAM card with 8K of RAM, and the System 3 combines a full 32K of static RAM with a minifloppy disk drive, a controller and disk operating a system.

The System 1 costs $549 in kit form and $699 assembled and the System 2, $699 in kit form and $899 assembled. Each 8K of additional RAM is $129.

The System 3 costs $1,499 as a kit and $1,799 assembled from P.O. Box 36051, Los Angeles, Calif. 90036.

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Country	Installed Value of General Purpose Computer Systems	% of total world value	World Rank as DP Market
United States	36,100	45.3%	1
Japan	8,331	10.0	2
W. Germany	6,527	7.9	3
United Kingdom	4,794	5.8	4
France	4,768	5.8	5
Canada	2,301	2.8	7
Italy	2,119	2.6	8
Australasia	2,044	2.5	9
Brazil	532	.8	17
Middle East	328	.4	22

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Northeast Show Gets New Date

BOSTON — The Northeast Computer Show at the Hynes Auditorium here, originally scheduled for April 6-9, has been moved to the weekend of Sept. 28-30 because of a need for more exhibit space, according to the sponsors, Northeast Expositions.

The show will include two sections. One, for personal computing, will feature games, graphics and small computer systems, and the other will highlight small business systems for word and data processing.

Information on attending or exhibiting is available from Northeast Expositions, Box 678, Brookline Village, Mass. 02147.

Program Tells Sun's Position

GUILDERLAND, N.Y. — Solar energy designers or anyone interested in how the sun moves can now take advantage of Sungraph from Solartek, which was designed to calculate and graph the position of the sun.

Using the program, the sun's local elevation and azimuth can be calculated at any location on earth, the firm said. Options include graphs of elevation vs. time of day, azimuth vs. time of day and maximum elevation vs. date and elevation at a specified azimuth vs. date. A save option allows a graph to be stored on cassette and reloaded later.

Written in Radio Shack TRS-80 Level II Basic, the program requires 13K bytes of storage. The product is available on cassette for $49 or on diskette for $75 from Solartek, P.O. Box 298, Guilderland, N.Y. 12084.

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Technical Know-How Not Enough

DP Firms Need Balanced Management

By T.G. Bartholdi
Special to CW

Too many computer companies have short-lived histories that read like three-act plays.

In Act 1, a brilliant young engineer, working for an established electronics firm, develops a great new product and decides to start his own company.

As Act 2 unfolds, the investment community begins to take an interest in the new firm. Venture capital is provided, production gets under way and hopes run high.

By Act 3, the mood becomes gloomy. After a quick takeoff, the new company runs out of gas. Management problems abound, and venture capitalists begin to search for a chief executive from outside the firm to salvage their investments and put the company back on a fast track.

Sometimes the curtain goes down on a failure because the company and its inventors react too late. In other cases, the business booms when strong executive leadership is provided and management problems are solved.

Whatever the outcome, the drama poses an important question for the DP industry to consider: Why do so many companies in the computer field seem to reach a point in their histories when they must look outside the organization for professional managers to run the business?

Many in the executive recruiting field believe the reasons for this trend are related to the success experienced by the computer industry in its infancy. Some 20 years ago, the dazzling capabilities of computers sold themselves.

The industry clearly was driven by technology. Breakthroughs in hardware and software, in effect, made their own markets and required little general business direction.

In recent years, though, experience has shown that computers are more marketing-driven than technology-driven. Competition is keen and technical resources are universal.

Yet, in many cases, computer companies have done little to develop skillful, well-balanced, professional executives. Many companies today — during the third decade of the industry — are still counting on technological superiority alone to pull them through.

The greatest single need of the DP field is for greater emphasis on professional business management. Computer companies — especially new and emerging firms — cannot reach their full potential without soundly schooled and well-rounded executives who can manage the critical balance between technology and marketing.

Steps Toward Management

Management consultants and executive recruiters recognize there are a number of possible steps a company can take to promote strong and effective long-range management:

• *Identify high achievers.* Through on-the-job training or formal management development programs, bright young executives must be retained and prepared for important posts, whether they come from technical or marketing phases of the business. Performance evaluation programs based on the attainment of clearly defined objectives are a good way to spot the top talent within the firm.

• *Develop protected group executives.* Some firms wait until the courts order employment and promotion of women, blacks and Hispanics. In those cases, Affirmative Action programs are poorly conceived, hastily implemented and largely unworkable. It is far better to make long-range plans for hiring, retaining and promoting women and members of minority groups.

• *Plan for departures.* Companies should assess their capabilities for filling key management positions and establish manpower-planning or replacement-charting programs to prepare the right people for the top positions.

• *Recruit outsiders.* An exclusive promote-from-within policy is not in the best interest of any company. Dynamic firms always benefit from an occasional infusion of new blood and fresh ideas.

(Continued on Page 60)

Consolidated Computer Makes Big Profits, Unveils Products

By Marcia Blumenthal
CW Staff

TEMPE, Ariz. — Substantial profits for the third consecutive year and two new products are helping Consolidated Computer, Inc. (CCI) erase the memory of being bailed out of bankruptcy by the Canadian government in 1971.

As a further manifestation of the company's financial health, CCI, Canada's largest computer firm, has moved its U.S. subsidiary, Consolidated Computer International, Inc., from Waltham, Mass., to Arizona. The primary reason for the move was a major contract with the state of Arizona for the development of a remote job entry system, according to Evan J. Pennick, CCI's vice-president and general manager. This system is very different from CCI's traditional key-to-disk data entry product line, Pennick added.

At a press conference held at the new facility here, CCI announced its Key-Edit Series 2 models 22 and 24 intelligent terminal systems, the first CCI products to use Fujitsu Ltd. technology. Company executives also used the occasion to report on the firm's financial progress.

Under an agreement with Fujitsu, CCI has the right to search through Fujitsu's small business systems products and select those which can be Westernized and marketed in North America, Pennick explained. In return, Fujitsu has a 20% equity interest in CCI, with an option to purchase an additional 5% of the company.

Negotiations with the Japanese to get the intelligent terminal system off the ground took nearly two years even though "the hardware for the new terminal was an off-the-shelf product at Fujitsu when we started negotiating with them," Pennick said

The equity arrangement with Fujitsu stemmed from previous OEM business with the Japanese firm, which supplied fixed-head disks for a CCI system."Apparently, Japanese companies like to be associated with other companies that have government involvement," Pennick remarked.

Change of Emphasis

In retracing some of the financial progress made by CCI since the Canadian government rescued the failing key-to-disk maker [CW, Dec. 5, 1977], David C. Heuston, CCI's treasurer and vice-president of finance, said the firm set out to change its

(Continued on Page 60)

CW Photo by M. Blumenthal

At the CCI press conference were (left to right) Joseph Farley, sales manager; David C. Heuston, vice-president of finance and treasurer; and E.J. Pennick, vice-president and general manager of Consolidated Computer International, Inc., CCI's U.S. subsidiary.

AEA to Honor Fairchild's Hogan

PALO ALTO, Calif. — The American Electronics Association (AEA), formerly known as the Western Electronic Manufacturers Association (Wema), will award its 1978 Medal of Achievement to Dr. C. Lester Hogan, vice-chairman of Fairchild Camera and Instrument Corp., at a dinner meeting here Feb. 8.

Hogan will be recognized for his accomplishments as a scientist and inventor at Bell Laboratories, as a Harvard professor, as executive vice-president at Motorola, Inc. and as Fairchild's president and chief executive.

At Bell in 1952 and, later, as Gordon McKay professor of applied physics at Harvard, Hogan's research and inventions in microwave communications "drew worldwide attention from the scientific community" and are used today "in nearly every microwave system in the world," AEA noted.

During his 10 years at Motorola — as general manager of the Semiconductor Products Division in 1958 and later as executive vice-president — Hogan built what was then a single-line transistor laboratory operation into a $200 million company.

He joined Fairchild in 1968 as president and chief executive and engineered a comprehensive management realignment and major expansion program, credited with significantly increasing sales and earnings.

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Keynote — RICHARD E. WILEY, Kirkland & Ellis; Dr. DIXON R. DOLL, Pres., DMW Group; JACK R. EPSTEIN, Principal, Booz, Allen & Hamilton; ANTHONY OETTINGER, Prof. & Director of Programs on Information Policy Resources, Harvard University

Revising the Communications Act of 1934 — RICHARD E. WILEY, Kirkland & Ellis; The Hon. LIONEL VAN DEERLIN, House of Representatives; HARRY M. SHOOSHAN III, Esq., Chief Counsel, House Subcommittee on Communications; ROBERT R. BRUCE, Esq., Gen. Counsel, Federal Communications Commission; A.G.W. BIDDLE, Pres., Computer & Communications Industry; WALTER HINCHMAN, Esq.; WILLIAM G. McGOWAN, Chairman of the Board, MCI Telecommunications Corporation; WILLIAM G. SHARWELL, V. Pres., AT & T; EMANUEL FTHENAKIS, Pres., American Satellite Corp.; E.F. MURPHY, Pres., RCA Global Communications, Inc.

Network Strategy — Dr. HOWARD FRANK, Pres., Network Analysis Corp.; JOHN GANTZ, Director, SNA Acceptance Survey, Editor, Distributed Processing Reporting Service, International Data Corp.

Luncheon Address — HENRY GELLER, Esq., Asst. Sec. for Communications and Information, NTIA

Network Planning & Design — LYNN HOPEWELL, Dir. of Network Engineering Operations, Computer Sciences Corp.; ROBERT CRAIG, V. Pres., Chase Manhattan Bank; JAMES JEWETT, Prof., Grad. School of Management, Vanderbilt University

Telecommunications Management — HARRY NEWTON, Publisher, The Telecom Library; GERALD ELY, V. Pres., Merrill Lynch Company

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Optical Communications Technology for Networks — JEFFREY C. HECHT, Managing Editor, Laser Focus Magazine; JOHN E. FULENWIDER, Sr. Staff Consultant-Telecommunications Sciences, Arthur D. Little; Dr. IRA JACOBS, Dir., Wideband Transmission Lab., Bell Telephone Laboratories; BART BIELAWSKI, V. Pres., Sales & Marketing, Siecor Optical Cables Inc.

New Developments in Voice Network Applications — JAMES R. CARREKER, V. Pres., Product Dev., Datapoint Corp.; ROY LAYTON, Dir. of Communications, Allstate Insurance Company; WILLIAM HOOTEN, Communications Manager, Morrison Knudsen Co.; KERRY B. STEWART, Mngr./Telecommunications, Kellwood Company

Intelligent Network Switching Systems — JERRY W. FINEFROCK, Mngr., Network Management, Southern Pacific Communications Co.; MICHAEL D. BLACKWELL, Tandem Systems Marketing, AT & T

WEDNESDAY

Network Access & Interface — TOM J. MERCER, Communications Systems Consultant, Satellite Business Systems; B.H. HARCHARIK, Pres., Tymnet; RAY SANDERS, Pres., TRAN

Office Administrative Networks — HOWARD ANDERSON, Pres., The Yankee Group; JAMES DOUGHERTY, Communications Manager, Equitable Life Assurance Society

User's Voice in Telecommunications Policy — PHILIP ONSTAD, Mngr. Telecommunications Policy, Control Data Corp.; LARRY F. DARBY, Chief, Common Carrier Bureau, Federal Communications Commission; BERT C. ROBERTS, Jr., Sr. V. Pres., MCI; SEYMOUR R. ROSEN, Asst. V. Pres.-SMG, Citibank

ACS and the Future of Packet Networks — Dr. JOHN M. McQUILLAN, Mngr. Systems Analysis Dept., Bolt, Beranek & Newman, Inc.; LARRY ROBERTS, Chrmn., Telenet Communications Corp.; PETER D. MOULTON, Computer Communications Specialist, U.S. Senate Computer Center

Distributed Processing — JOHN GANTZ, Editor, Distributed Processing Reporting Service, International Data Corp.; ROBERT SANTOS, Asst. V. Pres.-Data Systems, AT & T; THEODORE HARRIS, Computer Systems Specialist, Environmental Protection Agency

Network Security and Encryption — BELDEN MENKUS, Consultant; R. BARRY ASHBY, Pres., Ashby and Associates; HERBERT BRIGHT, Pres., Computation Planning

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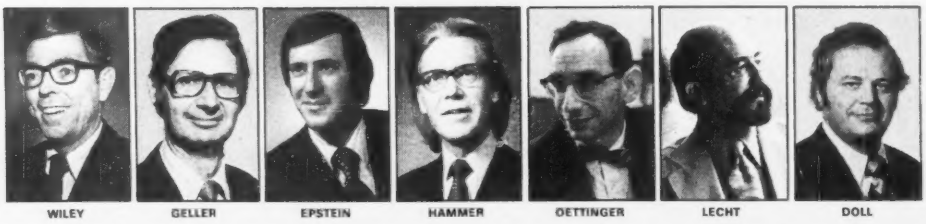

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Limited Distance Networks — GERALD MUELLER, Sr. Consultant, R.L. Dean & Associates; WILLIAM NUGENT, Dir., Automated Systems Office, Library of Congress; ED MILLBURY, V. Pres. Engineering, Gandalf Data, Inc.; GEORGE SPARK, Develcon Electronics

Trends in High Performance Network Components — ROBERT J. KAUFMAN, Mngr., Data Communications, Damon Corp.; Dr. DAVID LYON, Dir. of Research & Development, Intertel, Inc.; EDWARD MILLBURY, V. Pres.-Engineering, Gandalf Data, Inc.

Using Value-Added Networks — ELY S. LURIN, Principal, Input, Inc.; LYMAN HARDEMANN, Consultant-Telecommunications, R.L. Deal & Associates; ALLAN KRONENBERG, Telecommunications Dept., Metropolitan Life Ins. Co.;

Futurist's Field Day — DRAKE LUNDELL, Editor, Computerworld; CARL HAMMER, Dir., Computer Sciences, Sperry Univac; CHARLES P. LECHT, Pres., Advanced Computer Techniques; TED MERRILL, Communications Editor, Business Week; WINSTON E. HIMSWORTH, V. Pres., Salomon Brothers

THURSDAY

Electronic Message Systems — Dr. KAS KALBA, Pres., Kalba Bowen Associates, Inc.; PHILIP S. NYBORG, V. Pres. & Gen. Cnsl., Computer & Communications Industry Association; WILLIAM VON MEISTER, Pres., Digital Broadcasting Corp.; JOHN McLAUGHLIN, Exec. Dir., Postal & Allied Arenas, Harvard Univ. Program on Information Resource Policy; WILLIAM COMBS, V. Pres., Xerox Xten Service; CARVER WASHBURN, V. Pres. of Strategic Planning, Western Union Telegraph Co.; HAROLD R. JOHNSON, V. Pres., Marketing, American Satellite Corp.

Network Diagnostic & Test Equipment — J. LIGHTSEY WALLACE, Asst. Dir. of New Product Dev., Atlantic Research Corp.; ROSS A. SEIDER, Dir. of Systems Marketing, Codex Corporation; WILLIAM E. ALEXANDER, Systems Coordinator, Northwest Mutual Life Insurance Company

Privacy In Communication Networks — WILLIAM WEWER, Sutherland, Asbill & Brennan; JERRY LOBEL, Mngr., Computer Security & Privacy, Honeywell Information Systems; RICHARD SCHRIVER, Sr. V. Pres. Corporate Systems, Chase Manhattan Bank; JAMES HOWARD, Esq., Counsel, Natl. Telecommunications & Information Administration

Future of Communication Terminals — CHARLES CAMPBELL, Project Editor, Data Communications, Auerbach Publishers Inc.; DANIEL H. CARTER, Mngr., Strategic & Long Range Business Planning, Texas Instruments Digital Systems Group; ROBIN WHITE, Dir. of Product Planning, ADDS, Inc.; JOSEPH SIMMONS, V. Pres., Threshold Technology

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Indicates Most Attractive Markets

CIA Details DP's Part in U.S. Trade Deficit

International News

By Bohdan Szuprowicz
Special to CW

During 1977 the U.S. foreign trade deficit reached an unprecedented $31.2 billion. As a result, everyone from President Carter down to the programmer trainee is concerned about the situation and is looking for ways to improve America's foreign trade position.

Not to be outdone is the Central Intelligence Agency (CIA) which, apart from its notorious foreign intrigues, is also engaged in a series of extensive economic and foreign trade research programs. In a report on "The Role of Less Developed Countries [LDC] in the U.S. Balance of Payments," the CIA provides some valuable insight into the role played by the U.S. computer industry in foreign trade.

According to the CIA report, released last September, the U.S. exported a total of $3.7 billion worth of computers and office equipment in 1977. At the same time, however, the U.S. imported almost $1.6 billion of similar merchandise, thus contributing to an industry trade surplus of $2.1 billion.

On a worldwide basis, exports increased by 24% over 1976, but imports also crept up at a relentless 17%. Considering the size of the American import market, this amounted to a healthy $237 million and is going up, cutting into the surplus.

Growing Markets

The fastest growing export markets for U.S.-made computers and office machines turned out to be the LDCs in the Organization of Petroleum Exporting Countries (Opec), mainly Arab states to which the U.S. exported $78 million worth of such equipment in 1977, up by 48% from the previous year.

The least attractive export markets appeared to be the communist countries, where American exports totaled only $22 million in 1977, down by 28% from the 1976 all-time high of $36 million. The trade surplus from that area in 1977 came to a mere $18 million as a result of decreasing exports, and even the appearance of some imports from communist countries that began showing up since 1976 in U.S. trade statistics.

The Japan Situation

Japan is another matter altogether. Since 1970, American imports of Japanese computers and office equipment increased from $145 million to, in 1977, $650 million.

During the same period of time, U.S. exports to Japan of similar products edged up from $203 million to $300 million. This, of course, was a much slower growth rate than that of Japanese imports, which jumped by 20% in 1977 alone.

As a result, the U.S. had a trade deficit with Japan in computers and office equipment to the tune of $350 million, which is fast increasing (not that this is anything to shout about when compared with U.S.-Japanese trade in automobiles. In that category, U.S. had a trade deficit with Japan of almost $5 billion in 1977).

To put it in proper perspective, the U.S. global trade surplus of $2.1 billion in computers and office equipment was wiped out two and a half times over by its deficit, resulting from imports of Japanese automobiles alone. Somehow, the American desire for Japanese wheels far outpaces the Japanese yen for American number-crunchers.

DP Not the Best

The CIA report ranked U.S. surplus trade balances in major manufactured goods categories. Contrary to some uninformed beliefs, computers and office machines were not the top-ranking industry contributing to a surplus in foreign trade.

In fact, among the top seven product groups, computers and office equipment ranked a distant sixth, ahead only of scientific instruments. Other product groups such as industrial machinery, chemicals, commercial aircraft, electrical machinery and military equipment provided a much larger surplus in U.S. foreign trade.

Among the major trade regions, the U.S. had the largest trade surplus in computers and office equipment with Western Europe, totalling $1.6 billion. Interestingly, Canada provided the U.S. with the second largest trade surplus in this category, which amounted to $400 million in 1977.

Other so-called developed countries such as Australia, Israel, New Zealand and South Africa contributed another $200 million in computers and office equipment trade surplus. Whether these countries will continue to do so in the future is questionable, of course, because all are intensifying their efforts to develop domestic computer and office equipment industries specifically to cut down on their imports.

Promising Market

The Opec and non-Opec developing regions each contributed $100 million in computers and office machinery trade surplus to U.S. exporters in 1977. These countries consist of about 140 different states ranging from Afghanistan to Zambia, most of which will never be able to develop their own computer or office equipment production. Thus they will continue to present an increasing import market as their industrialization proceeds.

Among them, the Arab computer markets supplied mainly by France, the U.S., West Germany, Italy, the UK and Japan are probably the most attractive. In fact, Arab computer markets are now becoming larger than the total import market share of all Western computer suppliers in the Soviet bloc countries.

This is so because of intense development of domestic production and shortages of hard currencies in Comecon countries. In comparison, the Arabs have all the petrodollars they need, and their computerization programs are only limited by shortages of trained personnel.

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Group Formed to Support Micro Industry Interests

By Marcy Rosenberg
CW Staff

WOODSIDE, Calif. — The various segments of the microcomputer industry will now be represented as a group by a new association formed to support the growth and development of the "low-cost computing" business.

Call the Microcomputer Industry Trade Association (Mita), the organization is open to hardware manufacturers, software producers, retailers, system houses, distributors, consultants and publishers, according to Jim Warren, interim Mita president.

The microcomputer, or personal computer, industry "is in the early stages of developing a large consumer market" and must therefore begin to address such issues as interface standards, warranty and service policies, retailer support and consumer education, Warren said.

Mita plans to deal with these issues and serve as a collective voice for its members on proposed legislative actions affecting the computer industry as a whole.

Informal Survey

To gauge industry concerns, the association conducted an informal survey of retailers and producers of mainframes, peripherals and software. Among the problems cited was a lack of warranty policies for microcomputer products.

Currently, "there are 500 to 800 retail computer stores" that either offer "only 30-day to one-year warranties or none at all," Warren said, emphasizing the need to come up with standards for better warranties.

Standards are also needed for connecting computers to telecommunications systems and other equipment, he maintained. "The only interface standard now is RS-232. The industry is trying to get the S-100 bus standard and would like a standard for interfacing parallel devices."

Consumer Education

Consumer education is another issue that warrants Mita's attention, according to Warren. As the microprocessor continues to bring down the cost of computing, "it becomes economically possible to put more computer control under the auspices of the end user" who, in this market, "often is a true lay consumer," he noted.

Users, especially in the home entertainment, education and research markets, need to be taught "how to use computer equipment and what is and is not possible on a computer," Warren explained.

Other problems in the area of distribution affect both manufacturers and retailers, he added. "Manufacturers require unreasonable prepayment from retailers and offer them inadequate margins. And retailers ship equipment with poor service, warranty and repair backing."

Mita plans to tackle these issues in a number of ways. The association will publish an industry newsletter; conduct independent surveys and distribute these to members free of charge; and hold educational seminars on such topics as how to finance and run a small business and how to identify and deal with problems in the retail computer industry.

In addition, the association expects to propose membership benefit programs such as group insurance, credit reporting and travel discounts.

"We are also considering holding our own trade show or combining efforts with an existing trade show," Warren noted.

The next Mita general membership meeting will take place May 11-13 at the Fourth West Coast Computer Faire in the San Francisco Civic Auditorium. At that time, a permanent board of directors will be elected.

A full membership drive is expected to begin early this year, Warren said, adding that the board is looking for an executive secretary to function as association administrator.

Interested firms are asked to send a $100 donation which will be applied to membership dues when they are established at the May meeting.

Further information is available from Warren at Mita, 345 Swett Road, Woodside, Calif. 94062.

'78 Sales at $500 Million

Report on Micros Released

MENLO PARK, Calif. — Dataquest, Inc. has released a report on the personal computer industry estimating that 1978 sales reached about $500 million and predicting that sales will grow to more than $2.4 billion by 1982.

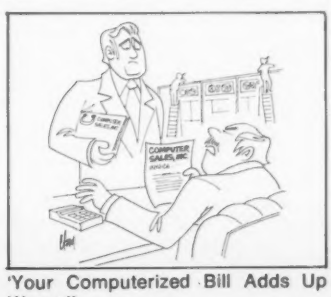
Dramatic changes are in store for the industry as large semiconductor and consumer electronics suppliers enter the marketplace, Dataquest said.

From the rudimentary microcomputer kits first offered in 1974, personal computer products are expected to continue to evolve over the coming years as more peripherals become integrated into the central chassis and as more computing power becomes available per dollar of expenditure.

The report noted that the key to success in the personal computer industry will be distribution. Over the coming years, manufacturers are expected to experiment with many different types of product distribution.

The Dataquest report is part of the company's Minicomputer Industry Service, which costs $7,000 a year.

Further information may be obtained from Dataquest at 3000 Sand Hill Road, Menlo Park, Calif. 94025.



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Well-Balanced Management Vital to DP Firms

(Continued from Page 55)

For some top posts, there may be better qualified candidates in other companies. Sometimes, it is even necessary to go outside the industry for certain specialists.

• *Expose executives to other fields.* Another way of injecting fresh ideas and learning about other industries is to provide opportunities for management personnel to work in other fields. Some large companies have done this by granting sabbaticals for employees who can benefit by experience in government, education, banking, insurance and other fields.

• *Establish and maintain formal ongoing management development courses.* Middle managers should receive continuing education in all phases of business, including engineering, manufacturing, marketing, finance, budgeting and communications.

• *Practice in-house rotation of assignments.* Early and regularly during their careers, key middle managers should be given a variety of responsibilities in different functions. It is especially important for technical personnel to work in marketing positions and for marketing managers to receive experience in technical positions.

These steps can help companies in the DP industry strike a balance between technology and marketing.

To Seed to Harvest

In reflecting on this observation, it is important not to confuse marketing with sales. As Prof. Philip Kotler of Northwestern University said, "One way to view the difference between marketing and sales is in terms of the difference between seeding a field [marketing] and harvesting the crops [sales]."

Kotler noted that "only a handful of companies" — his list included IBM, Xerox Corp. and General Electric Co. as the lone representatives of the electronic industry — "really understand and practice sophisticated marketing."

To successfully direct the operations of a computer company in today's business environment, a chief executive must recognize and understand technology, but should also possess experience in manufacturing, R&D, finance and control, advertising, sales and marketing research.

Chief executives of computer companies should be able to qualify information and impressions, understand customers' viewpoints, make projections and forecasts, manage specific markets, create product-life pricing strategies and lead the product-development process on the basis of marketing and financial realities.

Bartholdi is president of Bartholdi & Co., Inc., an executive recruiting firm in Wellesley Hills, Mass.

Consolidated Computer Erases Bad Memory, Regains Health

(Continued from Page 55)

sales emphasis. It switched from the OEM to the end-user market and undertook the development of new products.

"During the restructuring, we considered changing the name of the company, but we decided we could live with the bad financial reputation because of our technological reputation," Heuston noted.

Heuston thinks CCI has accomplished those two aims. In 1975, 80% of CCI's products were OEM, marketed primarily to one customer, the UK's International Computer Ltd.

This year, only $3 million of the company's more than $23 million is in OEM sales, Heuston said, with the remainder being sold to a diversified base of end-user customers.

In marketing its new Key-Edit Series 2, CCI is counting on large orders from its existing customer base. For instance, some of the larger service bureaus may order 25 of the systems to place with their customers.

"If we have a hard time getting these systems moving in any large quantities, then we may go to a distributor basis for sales," Pennick said. "But first we'll try to do it ourselves."

CCI would like to install 1,500 to 2,000 of the systems this year. "Then we can really consider going after the terminal market on a larger scale," Pennick said.

CCI is now concentrating its marketing efforts in the U.S. In 1976, the company had only $2 million in U.S. end-user sales but, in 1978, end-user sales jumped to about $11 million, Heuston said.

Oddly enough, now that CCI has started penetrating the end-user marketplace, it is again toying with the idea of OEM sales, but this time with a much wider base of companies.

"You have to be successful in your own end-user market to be successful in the OEM market," Heuston declared. While many OEM marketers may disagree with Heuston's formula for success, CCI's shift in marketing emphasis has been pumping profits back into the company.

Although audited 1978 figures are not yet available, Heuston estimated 1978 revenues at $23.5 million and earnings at about $650,000 compared with 1977 results of $18 million in revenues and $400,000 in earnings.

The ability to generate equipment sales must go hand-in-hand with the ability to provide lease financing arrangements, Heuston explained. "The computer business is a leasing business," he emphasized, adding that only 10% of CCI's revenues are derived from outright sales of equipment.

Recently, CCI negotiated a lease-financing line of credit with three U.S. banks and one Canadian bank. This credit line, really a third-party leasing arrangement, provides CCI with $82 million for lease financing until 1982. Although the Canadian government still owns an equity share in CCI of more than 60%, CCI foresees reducing that interest to 25% in the future, Heuston said.

One way the government may whittle away its interest in CCI is to give up its shares as part of a stock transfer in an acquisition made by CCI, Heuston suggested.

Representatives of the Ontario Development Corp. and the Enterprise Development Board, the Canadian government partners are members of CCI's board of directors. The government agencies guarantee some of CCI's loans and give approval for management changes, Heuston noted. In Canada, government agencies have a strong interest in seeing that manufacturing companies survive.

A product under way at CCI is the remote job entry system, the Series M, for various agencies within the Arizona state government. The system, which will probably be ready in four to five months, is tied into Honeywell, Inc. Level 6 minicomputers. CCI is selling the Level 6s to the state government since it underbid Honeywell for the contract.

Supershorts

Western Union Information Systems has agreed to sell the inventory, manufacturing and commercial sales rights for its microprocessor-based multiplexers to Halcyon Communications, Inc., a manufacturer of telecommunications and data communications test instruments. Western Union Information Systems will retain the right to manufacture multiplexers for the Western Union Telegraph Co. and its affiliates.

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On Range of Topics

Studies Compare U.S., European DP Markets

WALTHAM, Mass. — The Eurocast series of studies from International Data Corp. (IDC) reportedly allow market planners to more easily compare U.S. and European computer market segments.

Prior to Eurocast, in evaluating the two markets, market planners had to cope with reports that used different definitions and were inconsistent in approach and measurement method, IDC claimed. This was the case even if the reports came from the same research house, thereby making comparisons between the two markets impossible, IDC added.

Different Markets

For example, "minicomputers" are defined differently in Europe and in the U.S., Peter Rowell, managing director of IDC Europa, explained. "So in a way, European researchers have been studying a different market."

The Eurocast series "takes the most successful IDC U.S. market studies and produces European market studies on the same topics," Rowell continued.

The studies are researched and published in Europe as a joint venture between IDC UK and IDC Germany, Rowell said, but are specifically written for U.S. firms that want to market their products in Europe.

The first study in the Eurocast series focused on the European market for data entry and data communications products.

Others Completed

Reports on minicomputer and small business markets were recently completed and are ready for orders, Rowell noted.

Market studies planned for this year include a migration report of IBM 360 and 370 users; a two-volume study on the computer services industry; and investigations of application-unique terminals, distributed DP and OEM peripherals.

Results of the data entry and data communications market survey indicated that the installed base of these products will grow at an average annual rate of 19% through 1982. During that time, the value of that installed base will more than double, reaching $10 billion from the 1977 base of $4.9 billion.

Expansion Expected

While Germany, the UK and France will continue to be the major European markets for data entry and data communications products, increasing demand is coming from countries such as Finland and Belgium and these markets are expected to expand, IDC reported.

In addition, IDC found that this type of equipment is becoming more popular in commercial applications because of decreasing equipment costs. Previously, the scientific community was the primary user of this equipment, IDC said.

In terms of the number of units installed, clustered processing terminals and key-to-diskette data entry devices will be the top growth areas. The installed base for these product classes will grow at 34% and 33% respectively, IDC estimated.

The reports cost between $2,000 and $3,500 and are available from IDC at 214 Third Ave., Waltham, Mass., 02154.

Executive Corner

- John J. Splavec has been named vice-president of application products for Informatics, Inc.'s Software Products Group.
- Robert F. Barron Jr. has been appointed vice-president of finance, secretary and treasurer for Display Data Corp.
- Roger Johnson has joined System Development Corp. as president of the SDC Products Group.
- Bruce D. Thomas has been named project manager of Software International Corp. Thomas is responsible for manufacturing and financial systems data base design.
- Michael J. Callahan has joined Monolithic Memories, Inc. as vice-president of fabrication operations.
- David A. Young has been named controller of MSI Data Corp.
- Stephen Baur has been elected to vice-president of corporate relations at Harris Corp.
- Fred Lewis has been appointed director of distributed processing/-systems development for Basic Four Corp.

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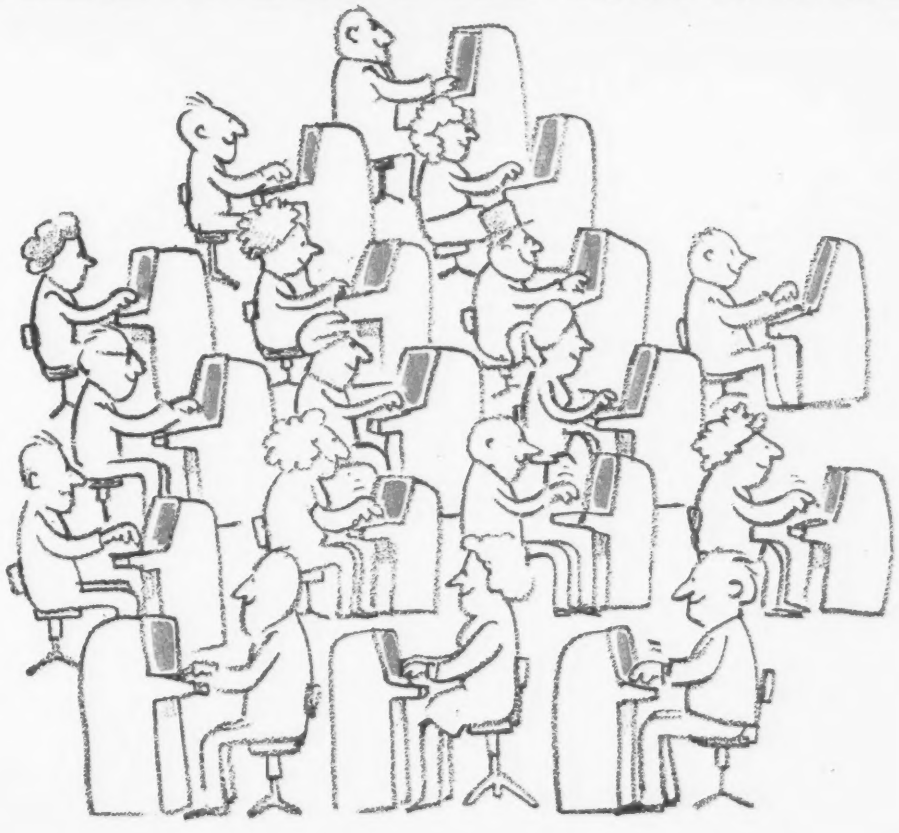

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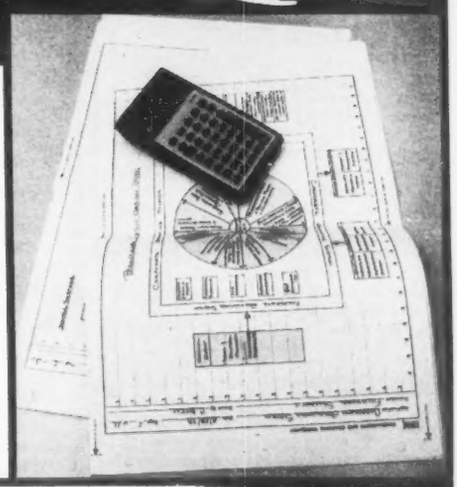

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nt northern telecom

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We have openings in our ATLANTA based R & D lab for Engineers and Programmers to design communications software for sophisticated word processing systems.

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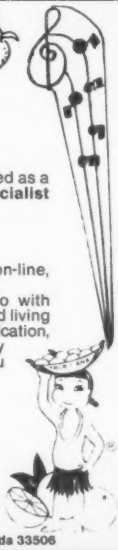

in a Florida vacationland. If you're highly qualified as a **Systems Analyst** or **Computer Security Specialist** ...we may be playing your tune.

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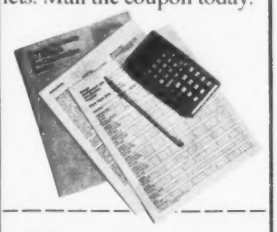

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"That situation still exists. Our growth continues to create outstanding opportunities for software professionals capable of contributing to every aspect of a project, from customer liaison and problem definition through final product development and user support. Employing such sophisticated software techniques as top-down analysis, code walk-throughs, and automated development tools, you'll enjoy, as we have, the total visibility environment that has rapidly become a trademark of Atlantic Operation.

"There may be a place here for you if you have a BS or MS degree, real-time programming experience, and familiarity with languages such as PL-1, FORTRAN, PASCAL, or Assembly languages. For your career and professional growth, think about joining us at Atlantic Operation. It's been true for us, it can be true for you: here's where a ground floor opportunity really starts."

Send resume and salary requirements to F.C. Brown, Atlantic Operation, Sylvania Technical Systems, Inc., 140 First Avenue, Waltham, MA 02154.

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GTE SYLVANIA

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ONE OF THE REASONS HE GOT TO BE A FOREMAN AT HIS FULL-TIME JOB IS BECAUSE HE LEARNED TO BE A LEADER AT HIS PART-TIME JOB.

Leadership training is a very important part of the Guard and Reserve programs. Because it takes leaders on many different levels to keep the military operating effectively. The leadership abilities learned and practiced in Guard and Reserve units have many business applications. Because if a person can lead a group of Airmen part time, he is equipped to assume a leadership role in business.

A lot of what Guard and Reservists learn can be put to good use in the business world. And that includes the many varied skills being taught in Guard and Reserve units. Those are just some of the reasons employers and supervisors should support the Guard and Reserve and urge their employees to join local units.

Those local Guard and Reserve units, from coast to coast, make up nearly 30% of our defense force at a cost of only a small fraction of the defense budget. Still another good reason for lending your support to the Employer Support of the Guard and Reserve program. Most employers are already behind us. Won't you join them? For details, write Employer Support, Arlington, VA 22209.

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We have been retained by a prominent international organization to recruit 8 high calibre software professionals for their new Advanced Systems Development Group. These individuals will be part of a top notch team involved in state-of-the-art development work for their world-wide computer network using IBM's most advanced hardware and software.

A sample of current projects include:

- **Interactive Software Development**
- **Modification & Enhancement to IBM Operating Systems Software**
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Our client offers an exceptional opportunity for long term career growth in a stable but rapidly expanding environment. Management is both responsive and technically capable. They offer highly competitive compensation ($20,000-$40,000) with solid future earnings potential and clearly developed career paths in both the technical and managerial areas. They are situated in a pleasant suburban location near a major city and varied recreational areas.

Exceptional individuals at all levels are invited to explore these opportunities in complete confidence. All responses will be answered promptly. Please call us collect or write:

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Cochise College in Douglas, Arizona is in need of a person to analyze & develop applications for a wide variety of business and educational uses. Bachelors degree in business or computer science, 5 years of experience, preferably in a college environment. Must possess the ability to communicate effectively with both computer systems practitioners and lay-users. Apply before January 30, 1979 to Personnel Office, Cocnise college, Douglas, AZ. Equal Opportunity Employer.

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Participate in the continuing development of one of the computer industry's most successful software products—ROSCOE.

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Booz, Allen & Hamilton, one of the largest and most prominent worldwide management consulting, technology and marketing research firms, seeks several highly skilled professionals to join our Chicago consulting practice. For those qualified, our consulting practice offers a unique opportunity to assist the top management of our client companies in dealing with the business and technical issues in their information systems plans and developments. The successful candidate will have:

- A BS degree; an MBA/MS desirable;
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  - Project planning, financial analysis, requirements definition, design and development of data bases, performance evaluation;
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Major NY bank located in the financial district seeks a Systems Analyst/Consultant having 5 years experience in the design & implementation of on-line COBOL systems to enhance & modify its overseas branch systems. Some data base exposure would be helpful. Foreign language skills are a major plus.

For information on these & other career positions, please call or send letter/resume in confidence to:

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Systems development will utilize IBM's VM/CMS facility. Program development will be interactive utilizing a data base management system. Systems will support multiple locations through CRT and RJE devices. Applications will use a 370/148 2 meg machine running OS/VS1.

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Systems Software Analyst Product Integration Specialist

Our Advanced Computer Development Group is looking for a top-notch systems analyst with good analytical and communication skills to assist in the complex task of integrating current development activity with defined product goals and existing proven software structures. Working on Wang's new 32-bit Virtual Memory Computer Systems, this position offers an extraordinary opportunity for involvement in many facets of the software development for a major manufacturer's general purpose computing system.

If you really want to be effective in contributing to state-of-the-art computer systems development, this is the place. Necessary qualifications include system programming experience, good communication skills, and a record of professional excellence.

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This position offers excellent professional growth and advancement opportunities. Necessary qualifications include good analytical and communication skills, with system programming experience or a degree in Computer Science.

Computer Architecture Designers and Microprogrammers

You have a good background in digital circuit design, preferably with some hands-on experience in designing computers for general purpose non-numeric computation. You have a basic understanding of systems software such as operating systems, compilers, or data base management systems and are interested in solving hardware/software tradeoffs. You have a strong programming and microprogramming experience and are familiar with the leading microprocessors and their applications. If you have a background in systems design, networking, distributed processing, and especially peripheral interfacing, we want to talk with you.

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You are interested in providing "easy-to-use" end user interfaces for a major new offering in integrated business computer systems. You are familiar with advanced data base concepts and have special expertise in query and report languages. You are interested in integrating data description and data entry facilities within a data dictionary/data base environment. You have a proven track record in defining and implementing state-of-the-art end user oriented software. This is a highly visible position in our Advanced Systems Software Development Group, providing the opportunity to influence the way end users will interface with integrated business systems of the future. If you are interested in creatively solving the interface problems, for the "real" end user, i.e., the data entry person, secretary, clerk, assistant, accountant, etc., as well as the COBOL and RPG programmer, then we would like to talk with you.

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We have several positions open for competent computer system professionals to assist in the challenging job of clarifying and organizing the vast body of software design knowledge developed in support of Wang's new 32-bit Virtual Memory Computer Systems. As System Design Documentation Specialist, you'll develop system overview and program logic manuals, maintain functional reference manuals, and help coordinate the flow of product development information to our technical writing department. As collector, organizer, contributor, and editor of these formal technical communications, providing clear, organized information on current software structures, facilities, and conventions, you'll help us educate our fast growing research and development staff.

We're looking for capable individuals familiar with operating systems, compilers, data base management, or telecommunication systems, who enjoy creating lucid models and descriptions of otherwise complex structures. These positions offer excellent visibility and numerous possibilities for advancement within the corporation. Necessary qualifications include systems programming experience, competence in reading IBM 360/370 assembly language programs, good communication skills, and a desire for professional excellence.

Please send your resume, including salary history, to Elaine F. Rosenberg; or call her at (617) 851-4111, Ext. 2798.

We offer excellent salaries and benefits. If you are unable to call Elaine, please send your resume to her attention at Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851.

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Growing Service Bureau in Denver, Colorado wishes to fill a position of Data Base Administrator using a UNIVAC 1100/80 for batch and on-line systems. Must have experience in DMS 1100 plus 3 yrs. min. data base design experience. Salary commensurate with experience. Excellent company benefits and professional working conditions, send resume in conf. to:

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MANAGEMENT INFORMATION SYSTEMS

SYSTEMS SPECIALIST

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NCR NEAT/3

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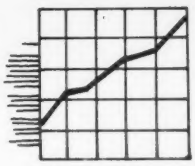

Your Learning Curve

It simply means we determine in our interview whether you have a healthy appetite for continued learning to increase the scope of your technical and business knowledge. If so, we make certain the position we place you in offers the right salary plus the right opportunity. That's a Romac difference and the reason so many highly qualified professionals in EDP rely on us.

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Contact your local Romac office in Atlanta, Boston, Buffalo, Charlotte, Hartford, New Haven, Philadelphia, Portland, Rhode Island, Rochester/Syracuse, Stamford, Wellesley Hills or write A. L. Lemay, President, 2 Sun Life Executive Park, Wellesley Hills, MA 02181

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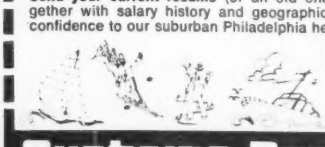

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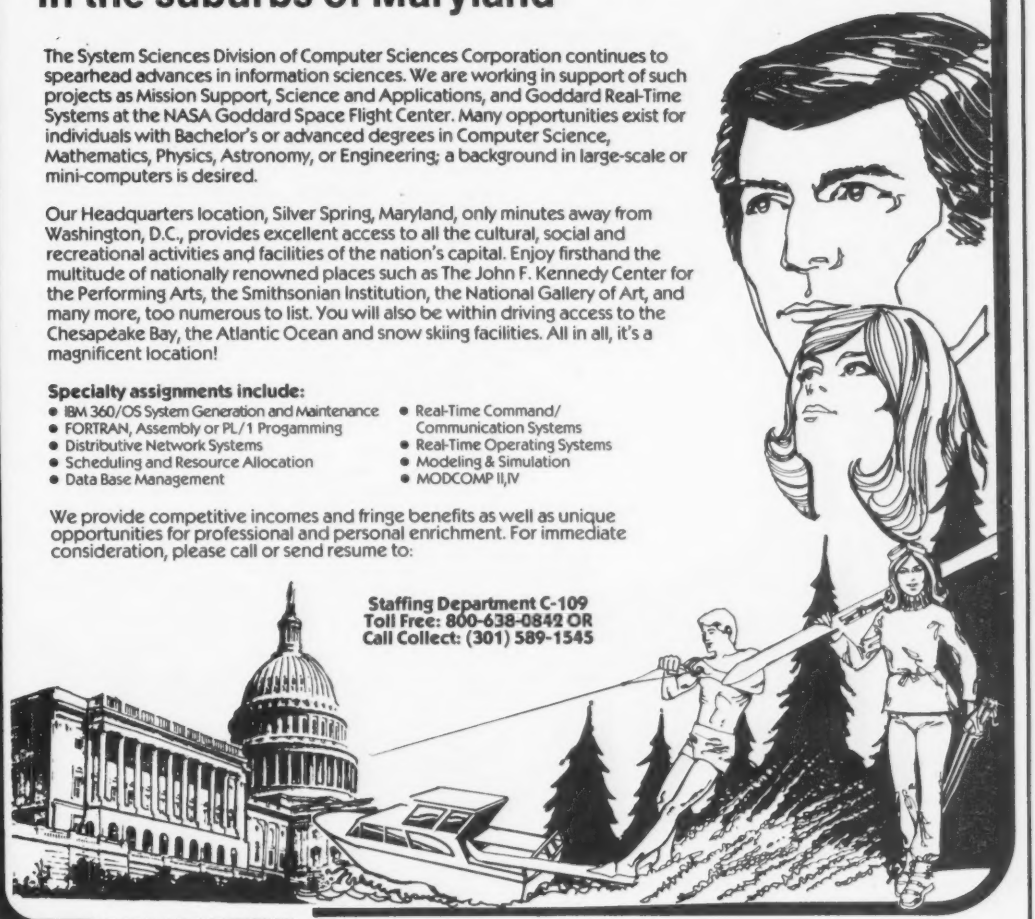

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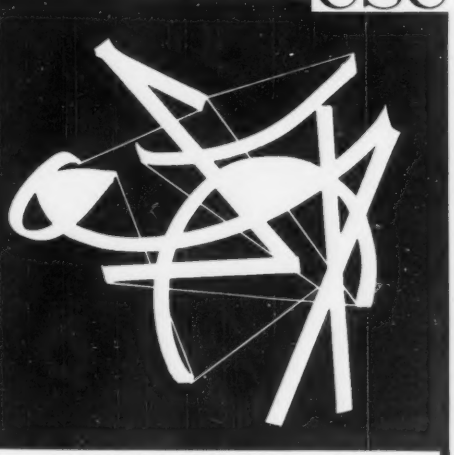

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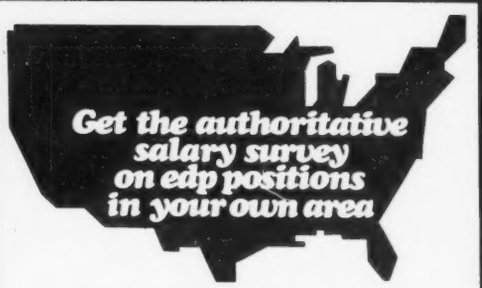

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You will be responsible for assisting our decentralized divisions in: resolution of problems, analyzing job stream requirements, work flow scheduling and design and analysis of data base systems. You should possess a degree plus 2 years experience in business systems and COBOL programming, preferably in an OS JCL environment.

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For more information, or to apply, call Dianne Reason toll-free at (800)336-0429, or collect at (703)533-8877.

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To help maintain our Data Processing momentum, we have recently created a new position, which is responsible for hardware coordination and installation planning, site preparation, change control and hardware capacity planning. This position reports to the Manager of Computer Operations and requires an individual with broad-based background and exposure in large computer installations. This is a troubleshooting job and therefore an ability to interface with vendors and technicians, as well as with varied levels of management is a must.

Unionmutual is located in Portland, Maine (less then 2 hours from Boston), one of the Northeast's most desirable cities with the amenities of the city and yet four-season recreation within minutes. We offer excellent fringe benefits with relocation included and a salary to the low $20's. If you feel you meet these qualifications and are interested in increased opportunity and greater challenges, please send resume and salary history to:

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Director of Employment

Unionmutual
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Gould, Inc., a rapidly expanding manufacturer of hose and coupling assemblies, located in Manitowoc, Wisconsin is actively seeking a Programmer for its Data Processing department.

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for Computer Network

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Candidates should have educational computing experience, command of two higher-level programming languages, knowledge of IBM-JCL and utilities, and show proficiency in the area of standard academic software. The position will require management of a support staff; heavy interface with the academic and administrative comunities of the user institutions, as well as hardware and software vendors.

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Supervise and direct the computer operators of the Data Processing Department, City of Alexandria, VA. Staff consists of 4 computer operators; Mainframe Honeywell, Data Net 2000. Be responsible for EDP workloads from Data entry to output quality control. Must apply by February 2, 1979.

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City of Alexandria
125 N. Royal Street
Alexandria, VA 22313
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Staff Employment Office
Univ. of Washington
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Seattle, Wa. 98195
206-543-2534

DATA PROCESSING

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Carrollton, GA 30117
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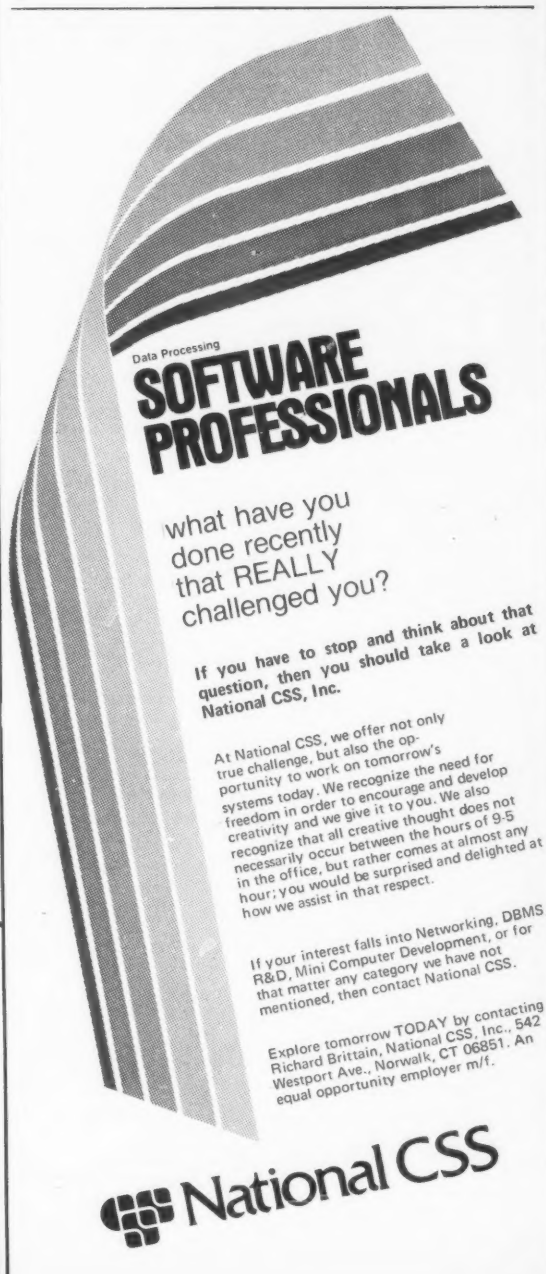

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San Francisco Bay Area

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UnionTrust Bank

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DATA PROCESSING

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NOTE: Candidates located in the San Fransisco and Los Angeles areas who are interested in the above position, the Manager of Systems Programming will be conducting interviews on February 5th thru 9th. Please call COLLECT (617) 777-1900, Ext. 2407.

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Palo Alto, CA 94303
(415) 324-1990

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Contact:

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800 Enterprise Drive
Oak Brook, IL 60521
(312) 887-1845

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PRIME

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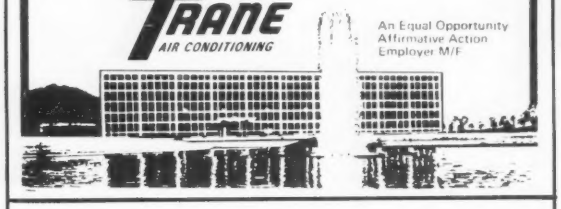

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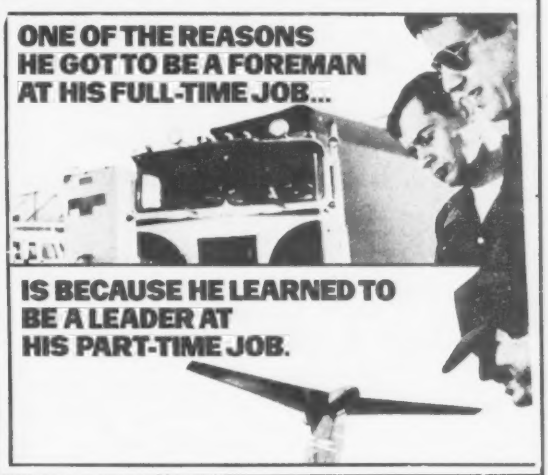

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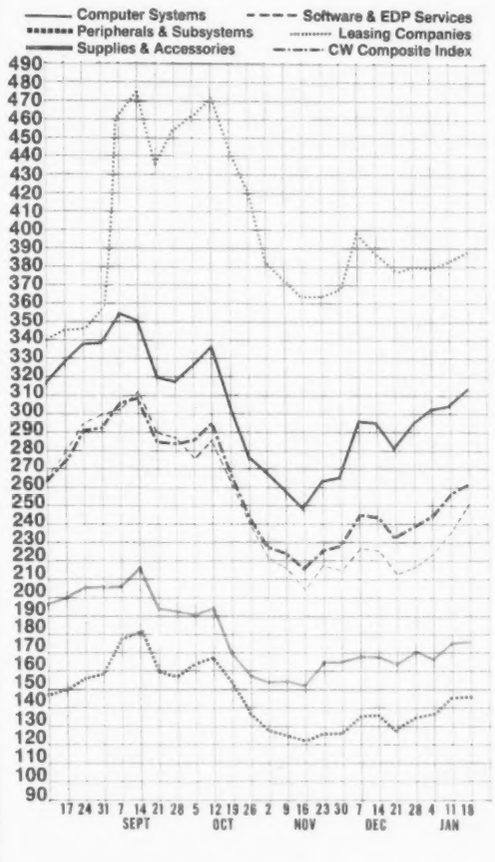

Earnings Reports

NATIONAL SEMICONDUCTOR
Three Months Ended Dec. 10

	1978	1977
Shr Ernd	$.61	$.43
Revenue	168,883,000	119,135,000
Earnings	8,681,000	5,580,000
28 Wk Shr	1.26	.84
Revenue	353,046,000	250,253,000
Earnings	18,833,000	10,960,000

ON-LINE SYSTEMS
Three Months Ended Oct. 31

	1978	1977
aShr Ernd	$.39	$.27
Revenue	7,260,577	5,718,519
Earnings	528,612	360,854
a6 Mo Shr	.74	.51
Revenue	14,085,397	10,036,758
Earnings	1,004,217	673,044

a-Adjusted for three-for-two stock split paid in November 1978.

TAB PRODUCTS
Three Months Ended Nov. 30

	1978	1977
Shr Ernd	$.50	$.30
Revenue	16,819,000	14,016,000
Earnings	634,000	385,000
6 Mo Shr	.92	.69
Revenue	32,003,000	26,888,000
Earnings	1,158,000	870,000

DATAMETRICS
Year Ended Oct. 31

	1978	1977
Shr Ernd	$.15	a$.61
Revenue	3,357,527	3,097,299
Tax Cred	...	108,000
Earnings	89,779	254,544

a-Adjusted for stock dividends.

INTEL
Year Ended Dec. 31

	1978	1977
Shr Ernd	$3.24	a$2.38
Revenue	400,620,000	282,549,000
Earnings	44,314,000	31,716,000
3 Mo Shr	.98	a.65
Revenue	119,818,000	74,252,000
Earnings	13,471,000	8,682,000

a-Adjusted to reflect a five-for-four stock split paid in September 1978.

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Computerworld Stock Trading Summary

TRADE*QUOTES

CLOSING PRICES WEDNESDAY, JANUARY 17th, 1979

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

X		1978-79 RANGE (1)	CLOSE JAN 17 1979	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	28- 69	49 1/8	0	0.0
N	BURROUGHS CORP	59- 87	73 3/8	-1 1/8	-1.5
O	COMPUTER AUTOMATION	15- 44	23 1/2	- 1/2	-2.0
N	CONTROL DATA CORP	23- 44	36	+ 5/8	+1.7
O	CRAY RESEARCH INC	8- 33	31	+ 1/2	+1.6
N	DATA GENERAL CORP	42- 71	64 1/8	-1 3/4	-2.6
N	DATAPOINT CORP	34- 75	72 1/4	+1 3/4	+2.4
N	DIGITAL EQUIPMENT	39- 58	56 7/8	0	0.0
N	ELECTRONIC ASSOC.	2- 13	7	- 1/4	-3.4
A	ELECTRONIC ENGINEER.	9- 19	12	- 1/8	-1.0
N	FOUR-PHASE SYSTEMS	19- 46	33 7/8	+ 1/4	+0.7
N	GYRODYNE	28- 40	32 5/8	- 3/8	-1.1
O	GENERAL AUTOMATION	7- 26	16 3/8	+ 5/8	+3.9
O	GRI COMPUTER CORP	1- 3	1 3/8	0	0.0
N	HEWLETT-PACKARD CO	62- 95	90	-2	-2.1
N	HONEYWELL INC	43- 76	75 1/2	+3	+4.1
N	IBM	236-316	310 1/4	+ 5/8	+0.2
O	MANAGEMENT ASSIST	9- 29	20 1/2	+ 1/4	+1.2
O	MANUFACTURING DATA S	9- 23	21 1/8	- 1/2	-2.3
O	MICRODATA CORP	10- 23	18	+ 5/8	+3.5
O	MINI-COMPUTER SYST	4- 8	4 1/4	0	0.0
O	MODULAR COMPUTER SYS	7- 17	16 3/4	+1 1/8	+7.1
N	NCR	37- 69	68 1/2	+ 7/8	+1.2
N	PRIME COMPUTER INC	20- 43	32 1/4	- 1/4	-0.7
N	PERKIN-ELMER	17- 30	28 3/4	- 5/8	-2.1
N	SPERRY RAND	33- 49	47 3/4	- 1/4	-0.5
A	SYSTEMS ENG. LABS	11- 24	15 1/4	+ 1/4	+1.6
O	TANDEM COMPUTERS INC	13- 37	27 3/4	- 3/4	-2.6
A	WANG LABS.	12- 34	33 3/4	+ 5/8	+1.8
	LEASING COMPANIES				
O	BOOTHE COMPUTER CORP	13- 21	19 1/2	0	0.0
O	COMDISCO INC	5- 22	18	- 1/4	-1.3
A	COMMERCE GROUP CORP	1- 1	1 1/8	0	0.0
A	COMPUTER INVESTORS GRP	1- 7	3 7/8	- 1/8	-3.1
O	CONTINENTAL INFO SYS	5- 15	6 1/2	0	0.0
N	DATRONIC RENTAL	1- 3	2 1/8	+ 1/4	+13.3
A	DCL INC	3- 5	4 1/2	0	0.0
N	DPF, INC	8- 14	10 3/4	- 1/8	-1.1
N	ITEL	16- 36	26 7/8	+ 5/8	+2.3
N	LEASCO CORP	24- 36	35 1/4	- 1/2	-1.3
O	LEASPAC CORP	1- 4	2 3/8	0	0.0
A	PIONEER TEX CORP	3- 7	3 3/8	+ 1/4	+8.0
N	U.S. LEASING	13- 20	14 3/4	- 1/4	-1.6

EXCHG: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
I=INTERNATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
OTC PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

X		1978-79 RANGE (1)	CLOSE JAN 17 1979	WEEK NET CHNGE	WEEK PCT CHNGE
	HARDWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1	0	0.0
O	ANACOMP INC	8- 22	14 1/4	+ 1/4	+1.7
A	APPLIED DATA RES.	8 17	12 1/4	+ 1/8	+1.0
N	AUTOMATIC DATA PROC	24- 36	30 1/4	- 1/8	-0.4
O	BOLEMAN AMERICAN CPT	1 2	1 1/2	0	0.0
O	COMPUSERV NETWORK	5 12	7 1/4	0	0.0
O	COMPUTER HORIZONS	1- 9	6 1/2	0	0.0
O	COMPUTER NETWORK	6 16	5 3/4	- 1/4	-3.5
M	COMPUTER SCIENCES	8- 17	12 3/8	- 3/8	-2.9
O	COMPUTER TASK GROUP	1- 5	5	0	0.0
O	COMPUTER USERS	2 4	2 1/2	0	0.0
O	COMPUT AID DES SYT	4- 10	7 1/8	0	0.0
O	COMSHARE	6- 19	16 1/2	- 3/4	-4.3
O	CULLINANE CORP	14- 33	20	- 1/4	-1.2
O	DATA DIMENSIONS INC	4- 9	5	0	0.0
O	DATAPAR	1- 2	1 7/8	0	0.0
N	ELECTRONIC DATA SYS.	15- 25	19 3/4	+ 1/8	+0.6
O	INSYTE CORP	1- 3	1 1/8	0	0.0
O	IDS COMPUTER MARKET	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	4 3/4	0	0.0
O	KEYSTA CORP	1- 3	2 3/8	0	0.0
O	LOGICON	10- 19	12 1/2	- 5/8	-4.7
A	NATIONAL CSS INC	15- 36	29	+ 1/2	+1.7
O	NATIONAL DATA CORP	7- 13	9	- 1/8	-1.3
A	ON LINE SYSTEMS INC	12- 30	18	- 1/4	-1.3
N	PLANNING RESEARCH	4- 10	6 1/8	- 1/8	-2.0
O	PROGRAMMING & SYS	1- 1	1 1/8	0	0.0
O	RAPIDATA INC	3- 7	4 3/4	0	0.0
O	REYNOLDS & REYNOLD	18- 36	27 1/4	- 1/2	-1.8
O	SCIENTIFIC COMPUTERS	3- 9	7 3/4	0	0.0
N	SYMBAGRE INC	18- 33	31	+1 1/8	+3.7
A	UDS SYSTEMS	5- 8	6 5/8	- 1/8	-1.8
N	WYLY CORP	1- 7	5 3/8	- 1/8	-2.2
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH MULT	14 32	24 1/2	- 1/4	-1.0
O	ADVANCED MEMORY SYS	7- 18	14	- 1/4	-1.7
N	AMPEX CORP	10- 19	15 1/4	- 3/8	-2.3
O	ANDERSON JACOBSON	5- 10	5 7/8	- 1/8	-2.0
N	APPLIED DIG DATA SYS	9 22	11 3/4	+ 1/2	+4.4
O	ARDEMEX INTNL	3- 7	4 3/8	0	0.0
A	BELL+HOWELL & NEW	6- 14	11 5/8	- 3/8	-3.1
N	BUNKER-RAMO	10- 20	18	0	0.0
A	CALCOMP	3- 13	6 3/4	+ 1/8	+1.8
O	CAMBRIDGE MEMORIES	3- 9	5	+ 1/4	+5.2
N	CENTRONICS DATA COMP	16 37	33	+1 5/8	+5.1
O	CONTROLONICS	1- 4	1 1/4	- 1/4	-16.6
O	COMPUTER COMMUN.	6 87	6 3/8	0	0.0
O	COMPUTER CONSOLES	4- 10	8	0	0.0
A	COMPUTER EQUIPMENT	3- 6	4 7/8	0	0.0
O	COMPUTER TRANSCEIVER	1 5	4 1/2	0	0.0
O	COMPUTERVISION CORP	9- 30	26 1/4	+ 1/4	+0.9
O	COMTEN	9- 38	22 3/4	+1	+4.5
N	DENNEY CORP	13- 26	14	+1 1/8	+8.7
O	DATA ACCESS SYSTEMS	3- 14	10	0	0.0
O	DATA 100	9- 20	19 1/2	0	0.0
A	DATA PRODUCTS CORP	14- 25	18 3/8	+ 1/8	+0.6
O	DATUM INC	2- 6	3 1/4	- 1/8	-3.7
O	DECISION DATA COMPUT	2- 6	3 1/2	0	0.0
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
A	DOCUMATION INC	6- 34	23 1/2	+ 5/8	+2.7
N	DATARAM CORP	6- 32	16 1/2	- 1/2	-2.9
N	ELECTRONIC M.S.M.	4- 9	4 7/8	- 1/4	-4.8
A	EXBET TEK	1- 2	1	+	+6.2
O	GENERAL COMPUTER SYS	1- 3	2	0	0.0
O	GENERAL DATACOMM IND	9- 21	13 3/4	0	0.0
N	HAZELTINE CORP	10- 17	12 7/8	- 5/8	-4.6
N	HARRIS CORP	17- 36	32 3/8	+ 3/8	+1.1
N	INFOREX INC	6- 11	7 3/4	0	0.0
O	INFORMATION INTL INC	7- 12	9 1/4	- 1/4	-2.6
O	INFOTON	1 3	3 1/8	0	0.0
O	INTEL CORP	39- 62	57 1/2	0	0.0
A	LUNDY ELECTRONICS	4- 8	5 3/8	0	0.0
O	MSI DATA CORP	10- 19	12 5/8	- 1/4	-1.9
N	MEMOREX	27- 59	33 5/8	+ 5/8	+1.8
N	MOHAWK DATA SCI	6- 15	9 1/2	- 1/8	-1.2
O	OMEX	2- 6	5 1/2	0	0.0
O	PARADYNE CORP	9- 17	12 1/2	- 1/8	-0.9
O	PERIPH CORP	5- 12	10 3/8	0	0.0
N	PERTEC CORP	9- 17	11 7/8	+ 1/4	+2.1
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTEX CORP	2- 5	2 3/4	0	0.0
O	RECOGNITION EQUIP	7- 13	8 7/8	+ 1/4	+2.8
O	SCAN-DATA	1- 5	2 5/8	0	0.0
N	SEDGRAGE TECHNOLOGY	19- 46	33 1/4	+ 1/2	+1.5
O	T BAR INC	11- 20	18 1/4	- 1/4	-1.3
O	TALLY CORP.	4- 14	10	-3 3/4	-27.2
A	TEC INC	6- 13	7 3/8	- 1/4	-3.2
N	TERMINONIX INC	33- 54	51 3/4	- 3/4	-1.4
N	TELEX	3- 9	6	0	0.0
O	TESDATA SYSTEMS CO	9- 23	12 1/4	0	0.0
O	WELTEK INC	1- 2	5/8	0	0.0
	SUPPLIES & ACCESSORIES				
A	AMERICAN BUS FORMS	6- 11	8	0	0.0
O	BALTIMORE BUS FORMS	2- 4	1	0	0.0
A	BARRY WRIGHT	14- 34	33	+ 1/4	+0.7
O	CYPERNETICS INC	1- 1	5/8	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	16 7/8	- 1/8	-0.7
N	ENNIS BUS FORMS	8- 17	13	- 1/8	-0.9
N	3M COMPANY	43- 66	54	- 1/2	-0.7
O	MOORE CORP LTD	26- 34	29	- 1/4	-0.8
N	NASHUA CORP	18- 37	23 1/2	- 5/8	-2.5
O	STANDARD REGISTER	20- 27	23 3/4	0	0.0
A	TAB PRODUCTS CO	8- 16	13 1/4	0	0.0
O	UARCO	19- 51	51	0	0.0
N	WABASH MAGNETICS	10- 22	15 1/2	+ 1/8	+0.8
N	WALLACE BUS FORMS	18- 33	23 7/8	0	0.0

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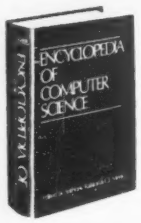

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